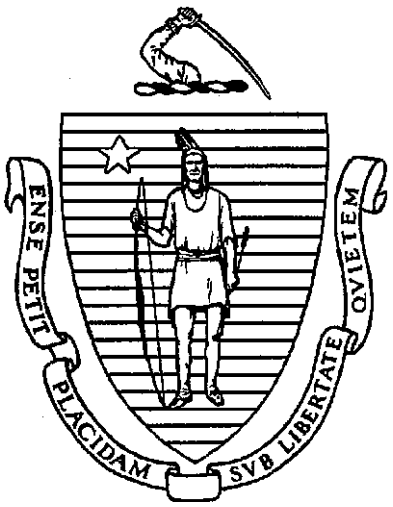


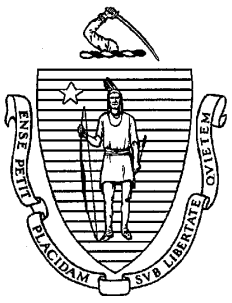
BID PACKAGE
COVER PAGE

DEPARTMENT OF MENTAL HEALTH
OFFICE OF ENGINEERING AND FACILITIES MANAGEMENT
167 LYMAN ST.
WESTBOROUGH, MA 01581

BID DOCUMENTS FOR:

2024-067A Emergency Generator Replacement
Corrigan Mental Health Center
49 Hillside Street
Fall River, Massachusetts 02720

Out to Bid: January 15, 2025



BID PACKAGE

TABLE OF CONTENTS

DMH PROJECT# 2024-067A
EMERGENCY GENERATOR REPLACEMENT
49 HILLSIDE STREET
FALL RIVER, MASSACHUSETTS 02720

NOTICE TO CONTRACTORS
WALK-THRU NOTICE

PART 1 – INSTRUCTIONS TO BIDDERS
PREVAILING WAGES
GENERAL BID FORM

PART 2 – FORMS FOR CONTRACT EXECUTION

PART 3 – GENERAL CONDITIONS

PART 4 – SPECS AND DRAWINGS

NOTICE TO CONTRACTORS
CLASSIFIED LEGAL ADVERTISEMENT

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE FOR HEALTH AND HUMAN SERVICES
DEPARTMENT OF MENTAL HEALTH
OFFICE OF ENGINEERING AND FACILITIES MANAGEMENT

General Bids Submission Deadline: **12:00PM, Friday, February 7, 2025**

The Category of Work is: **Mechanical Systems (Generator)**

Project Name: **2024-067A - Emergency Generator Replacement, (DCAMM Certification Required)**

Project Location: **Corrigan Mental Health Center 49 Hillside Street, Fall River, Mass. 02720**

Estimated Construction Cost: **$1,200,000**

Remove two (2) existing emergency generators and replace with one new 400KW emergency generator. Upgrade emergency power panels in building to meet code.

Minimum rates of wages to be paid on the project have been determined by the Commissioner of the Division of Occupational Safety under the provisions of Sections 26 and 27, Chapter 149 of the General Laws and will be included in the bid package.

Proposals will ONLY be submitted online via COMMBUYS website by the General Bids Submission Deadline date on forms furnished by the Department of Mental Health (DMH) and clearly identified as a bid, endorsed with the name and address of the bidder, and the project name.

Each general bid proposal must be secured by an uploaded photocopy of an accompanying **deposit of 5%** of the total bid amount, including all alternates, in the form of a bid bond, a certified, treasurer's, or cashier's check issued by a responsible bank or trust company made payable to the Commonwealth of Massachusetts. Awarded vendor will then mail the original 5% deposit bond or check to the Department of Mental Health Engineering and Facilities Management Department at 167 Lyman Street Room 158 Westborough, MA 01581. The Department reserves the right to waive any informality in or reject any or all Bids if it is in the public interest to do so.

Plans and Specifications will **ONLY** be available at **COMMBUYS** from **Wednesday 01/15/2025 until bid opening as amended**. Bid must be submitted electronically on COMMBUYS by the General Bids Submission Deadline date above. If you have any questions or concerns with using COMMBUYS, please contact the COMMBUYS help desk at 617-720-3197 (8am - 5pm EST Monday thru Friday).

Pre-Bid Conference: A **MANDATORY** Pre-Bid Conference will be held at **10:00AM on Monday 01/27/2025. Contractors should meet the Project Engineer in the lobby of Corrigan Mental Health Center at 49 Hillside Street, Fall River, MA 02720** to review and discuss project details. Please contact Gerald McCullough, DMH project Engineer, at **(617) 571-5254**. **After attending the Mandatory Pre- Bid Conference, all bidding questions must be uploaded to COMMBUYS by 12:00PM Thursday 01/30/2025.**

Project Duration is estimated at fourteen (14) months.

MBW/WBE Contractors are encouraged to inquire about this project.

DEPARTMENT OF MENTAL HEALTH
BROOKE DOYLE, COMMISSIONER

DEPARTMENT OF MENTAL HEALTH
OFFICE OF ENGINEERING AND FACILITIES MANAGEMENT
167 LYMAN STREET
WESTBOROUGH, MASSACHUSETTS 01581

DMH Project #2024-067A

EMERGENCY GENERATOR REPLACEMENT
AT
CORRIGAN MENTAL HEALTH CENTER
49 HILLSIDE STREET
FALL RIVER, MA 02720

NOTICE OF MANDATORY PRE-BID CONFERENCE

ALL CONTRACTORS INTERESTED IN BIDDING ON THIS PROJECT ARE HEREBY NOTIFIED OF A MANDATORY PRE-BID CONFERENCE AND WALK-THROUGH. COVID PRECAUTION & PRESCREENING ARE REQUIRED PRIOR TO ENTERING THE BUILDING

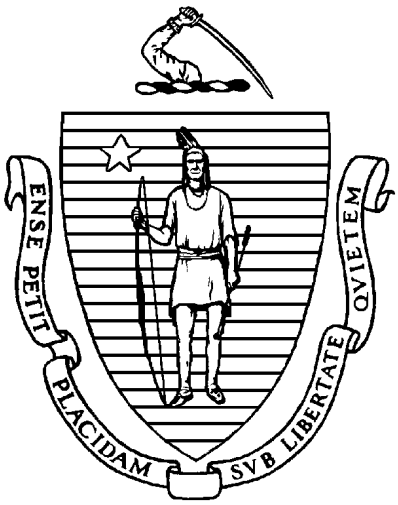
ON

MONDAY, JANUARY 27, 2025

AT

10:00 A.M.

CONTRACTORS ARE TO MEET IN THE MAIN LOBBY OF CORRIGAN MENTAL HEALTH CENTER LOCATED AT 49 HILLSIDE STREET FALL RIVER, MASSACHUSETTS 02720



BID PACKAGE

PART I

INSTRUCTIONS TO BIDDERS

2024-067A Emergency Generator Replacement
Corrigan Mental Health Center
49 Hillside Street
Fall River, Massachusetts 02720

Instructions to Bidders

Attachment A:
Minimum Wage Rates
Prevailing Wage Schedule – Bidder Acknowledgement Document

Attachment B: Form Used During Bidding
Form for General Bid

COMMONWEALTH OF MASSACHUSETTS
INSTRUCTIONS TO BIDDERS

Awarding Authority:
Department of Mental Health
Office of Engineering and Facilities Management
Hadley Building
167 Lyman Street
Westborough, MA 01581
(**617) 571-5254**

Project Title: 2024-067A Emergency Generator Replacement
Corrigan Mental Health Center
49 Hillside Street
Fall River, Massachusetts 02720

Category of Work: **Mechanical Systems (Generator)**

Project Description and Scope:

Remove two(2) existing emergency generators and replace with one new 400KW emergency generator. Upgrade emergency power panels in building to meet code.

Deadline for filing General bids is at: 12:00PM Friday, February 7, 2025

The minimum wage rate requirements for this Contract are located in Attachment A to these Instructions to Bidders.

Pursuant to M.G.L. c. 30, §39S(a) (2) all employees to be employed on the project must have successfully completed a course in construction safety and health approved by OSHA and of at least 10 hours in duration.

The Contractor must provide written verification as detailed in the General Conditions of compliance with Federal Department of Homeland Security Requirements, including but not limited to the Employment Eligibility Verification (Form I-9) Process.

Bid forms for this Contract are located in Attachments B to these Instructions to Bidders.

The work is to be accomplished within fourteen (14) calendar months from a Notice To Proceed, and will be specified in Article 2 of the Owner - Contractor Agreement for the successful bidder. Liquidated damages for failure to complete work on time is $500 per day, and will be stated in Article 2 of the Owner - Contractor Agreement.

Bidding Documents must be obtained via COMMBUYS website. If you need assistance with COMMBUYS, please call the COMMBUYS help desk at (617) 720-3197. COMMBUYS Job Aids for Vendors on how to use COMMBUYS are available by clicking the link below.

https://www.mass.gov/lists/job-aids-for-vendors-using-commbuys

As used herein, capitalized terms shall have the meaning assigned to them in the General Conditions of the Contract and the Owner - Contractor Agreement unless the context clearly indicates otherwise.

SECTION I - BIDDER'S REPRESENTATION

1.1 Each general bidder or sub-bidder (hereinafter sometimes referred to as "Bidder) by making a bid or sub-bid (hereinafter sometimes referred to as "Bid") represents and warrants that Bidder has visited and examined the Site and the Contract Documents, that Bidder is familiar with the local conditions under which the Work is to be performed, that Bidder has correlated personal observations with the requirements of the Contract Documents, and that where the Contract Documents require, in any part of the Work, a given result to be produced, the Contract Documents are adequate and that Bidder will produce the required result within the Bid price and that the Bid is made in accordance therewith.

1.2 Failure to so examine the Contract Documents and the Site will not relieve any Bidder from any obligation under the Bid as submitted. Neither the Commonwealth nor the Designer will be responsible for errors, omissions and/or charges for extra work arising from Bidder's failure to familiarize itself with the Contract Documents or existing conditions.

SECTION 2 -- GENERAL BIDDERS - CERTIFICATE OF ELIGIBILITY AND UPDATE STATEMENT

2.1 Every general bidder must submit the following with its general bid:
--A Prime/General Contractor Certificate of Eligibility issued by the Division of Capital Asset Management and Maintenance (DCAMM), showing that the Bidder has been approved to bid on projects for the category of work required and that the Bidder has a single project limit in an amount no lower than the amount of its Bid including all "add" alternates.
--A fully completed Prime/General Contractor Update Statement.

2.2 It is the Bidder's responsibility to obtain the necessary forms from DCAMM and to submit its Application for Certificate of Eligibility so as to allow sufficient time for DCAMM's evaluation of the application and issuance of a Certificate of Eligibility prior to the deadline for bidding.

2.3 The Prime/General Contractor Update Statement is not a public record as defined in M.G.L. c. 4, § 7 and will not be open to public inspection.

SECTION 3 – FILED SUB-BIDDERS - CERTIFICATE OF ELIGIBILITY AND UPDATE STATEMENT (NOT APPLICABLE)

3.1 (Not Applicable) Every filed sub-bidder must submit the following with each filed sub-bid:

--A Sub-Bidder Certificate of Eligibility issued by the Division of Capital Asset Management and Maintenance (DCAMM) for that sub-bid trade, showing that the sub-bidder has been approved to bid on projects of the category of work required.
--A fully completed Sub-Bidder Update Statement.

3.2 (Not Applicable) It is the sub-bidder's responsibility to obtain the necessary forms from DCAMM and to submit its Application for Sub-bidder Certificate of Eligibility so as to allow sufficient time for DCAMM's evaluation of the application and issuance of a Sub-Bidder Certificate of Eligibility prior to the deadline for bidding.

3.3 (Not Applicable) The Sub-Bidder Update Statement is not a public record as defined in M.G.L. c. 4, §7 and will not be open to public inspection.

SECTION 4 -- REQUESTS FOR INTERPRETATION

4.1 Any questions by prospective Bidders concerning interpretation of the Contract Documents must be uploaded to **COMMBUYS by 12:00PM Thursday, January 30, 2025.** The Awarding Authority will post any addenda or written interpretations on COMMBUYS that it deems necessary to Bidders at least 48 hours before the General Bids Submission Deadline Date. Bidders may NOT rely upon oral communications or interpretations from the Awarding Authority or the Designer and the Awarding Authority shall not be bound by them.

4.2 It is the sole responsibility of the Bidder to ascertain the existence of any addenda issued by the Awarding Authority on COMMBUYS, by Bidder.

4.3 Wherever in the Contract Documents reference is made to Massachusetts General Laws, it shall be construed to include all amendments thereto effective as of the date of the issuance of the invitation to bid on the proposed work.

SECTION 5 -- PREPARATION OF BIDS; ALTERNATES

5.1 General Bids shall be submitted on the Form for General Bid included in Attachment B to these Instructions to Bidders.

5.2 All entries on the Bid form shall be typewritten or in ink.

5.3 Where so indicated on the Bid form, sums shall be expressed in both words and numerals. Where there is a discrepancy between the Bid sum expressed in words and the Bid sum expressed in figures, the Bid sum expressed in words shall control unless the intention of the Bidder clearly is otherwise as determined by the Awarding Authority in its sole discretion.

5.4 Each General Bidder shall acknowledge all required alternates in Section C on the Form for General Bid by entering the dollar amount of addition or subtraction necessitated by each alternate. General Bidders shall enter a single amount for each alternate on the Form for General Bid.

5.5 If an alternate includes work within the Bidder's scope of work and does not involve a change in the cost of the Bid, the Bidder shall so indicate by writing "No Change" or "N/C" or "0" in the space provided for that alternate.

5.6 The lowest Bidder will be determined on the basis of the sum of the base Bid and the accepted alternates accepted by the Awarding Authority.

5.7 (Not Applicable) If the space for indicating a requirement for payment and performance bonds for filed Sub-Bidders is left blank by the General Bidder on the Form for General Bid, the Awarding Authority shall interpret this as a "NO".

5.8 (Not Applicable) Costs for the selected filed sub-bidder's bond premiums shall be paid for by the selected general Contractor bidder in accordance with M.G.L. c. 149, § 44F unless the project is a project in which contractor and subcontractor prequalification are required pursuant to M.G.L. 149, §§ 44D1/2 or 44D3/4.

5.9 (Not Applicable) If the general bidders are instructed to carry an amount for a given sub-trade, General Bidders shall list the subtrade and the amount provided by the Awarding Authority. The line under "bonds required" on the Form for General Bid should be left blank or marked "N/A" in order for subsection 5.10 to apply.

5.10 (Not Applicable) Upon solicitation of a subcontractor to perform the work required with respect to a subtrade referenced in subsection 5.9, the general Bidder's Contract Price shall be adjusted by the following: a) the difference between the subcontract amount and the amount carried in the general Bid; b) the total cost of the subcontractor's bonds, if the general Bidder requires such bonds after the solicitation is completed and if the general Bidder complied with 5.9 above; c) the documented increased costs for the general Bidder's bonds, if any, attributable to the incremental difference between the amount carried for the given subtrade and the actual subcontract amount.

5.11 (Not Applicable) Overhead and profit for supervision of the subtrade mentioned in subsections 5.9 and 5.10 above shall be included by all general Bidders in Item 1 of the subdivision of the Contract Price. No additional overhead or profit will be paid on the incremental difference between the amount carried for the subtrade and the subcontract amount as stated in M.G.L. c. 149, § 44F(4)(a)(2).

5.12 (Not Applicable) Sub-Bidders should not list Paragraph E sub-subcontractors unless requested to do so by the Awarding Authority.

5.13 Each General Bid must be accompanied by a bid deposit in the form of a bid bond; cash; or a check certified by, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the Commonwealth of Massachusetts. Any bid bond shall be (a) in a form satisfactory to the Awarding Authority, (b) with a surety company qualified to do business in the Commonwealth and (c) conditioned upon the faithful performance by the principal of the agreements contained in the Bid.

5.14 The amount of such bid deposit shall be **5% five per cent** of the value of the Bid including alternates.

SECTION 6 - SUBMISSION OF BIDS

6.1 Each General Bidder is to **include a photocopy of the bid deposit** of which shall be uploaded into COMMBUYS.

General Bid for:

Project Title: **2024-067A Emergency Generator Replacement**
Corrigan Mental Health Center
49 Hillside Street
Fall River, Massachusetts 02720

General Bidders name, business address, and telephone number below:

_____

6.2 All Bids must be received by the Awarding Authority via the COMMBUYS Website no later than the **Deadline for Filing General Bid date** specified on page 2 of these Instructions to Bidders. Any Bid received after these deadline dates and times will not be accepted.

6.3 Bidding results will not be given out over the telephone prior to 1:00 PM of the day following the General Bid opening.

SECTION 7 - WITHDRAWAL OF BIDS; REJECTION OF BIDS

7.1 Any Bid may be withdrawn prior by E-mailing Gerald McCullough at **gerald.mccullough@mass.gov** prior to the **Deadline for filing General Bid date on page one.**

7.2 A Bidder may withdraw its Bid without penalty by E-mailing Gerald McCullough at **gerald.mccullough@mass.gov** at any time up to the time of Award as defined below in subsection 9.1 only upon demonstrating to the satisfaction of the Awarding Authority that a death or disability has occurred or a bona fide clerical or mechanical error of a substantial nature was made during the preparation of the bid. Failure to demonstrate conclusively that a bona fide clerical or mechanical error of a substantial nature was made may result in forfeiture of the Bid deposit.

7.3 The Awarding Authority reserves the right to waive any informality in or to reject any and all Bids if it is in the public interest to do so. Without limiting the foregoing, the Awarding Authority reserves the right to reject unit prices which it deems unduly high or unduly low as unbalanced.

SECTION 8 - MBE AND WBE PARTICIPATION (not applicable)

SECTION 9 -- CONTRACT AWARD

9.1 "Award" means the determination, selection, and notification of the lowest, responsible and eligible Bidder by the Awarding Authority.

9.2 The Awarding Authority will award the Contract within thirty (30) days, Saturdays, Sundays, and legal holidays excluded after the opening of Bids in accordance with M.G.L. c.149 §44A.

9.3 The Contract will be awarded to the lowest responsible and eligible Bidder as determined by the Awarding Authority, except in the event of substitution as provided under M.G.L. c.l49, §§44E and 44F, in which cases the procedure as required by said sections shall govern the award of the Contract.

9.4 As used herein, the term "lowest responsible and eligible Bidder" shall mean the general Bidder whose Bid is the lowest of those Bidders who, in the Awarding Authority's opinion, are ready, willing and able to comply with all requirements of the Contract Documents and demonstrably possess the skill, ability, and integrity necessary for the faithful performance of the Work, based on the determination of past performance and financial soundness under (i) M.G.L. c.l49 §44A and following sections, (ii) the rules, regulations, orders, guidelines and policies promulgated from time to time by the Commissioner of the Division of Capital Asset Management and Maintenance ("DCAMM") and (iii) any other relevant criteria that the Commissioner may prescribe. If the Awarding Authority determines that any non-filed subcontractor chosen by a Bidder is not qualified or responsible, then the Bidder shall obtain another subcontractor satisfactory to Awarding Authority and the contract price shall not be adjusted.

9.5 The general Bid price shall be the price set forth in paragraph C of the Form for General Bid. No general Bid shall be rejected (i) because the sum of the prices set forth in Item 1 and 2 does not equal the general Bid price set forth in said paragraph C or (ii) because of one or more errors in setting forth the name, the sub-Bid price of a sub-Bidder, or the total of Item 2, provided that the sub-Bidder or sub-Bidders designated are clearly identifiable, or (iii) because the plans and specifications do not accompany the Bid or are not submitted with the Bid.

9.6 Should the Contract Documents require submission of special data to accompany the Bid, the Awarding Authority reserves the right to rule the Bidder’s failure to submit such data an informality and to receive said data subsequently within a reasonable time as set by the Awarding Authority, provided that no such ruling shall result in an unfair advantage to the Bidder.

9.7 The Awarding Authority also reserves the right to reject any sub-Bid if it determines that such sub-Bid does not represent the Bid of a person competent to perform the work as specified, or if fewer than three sub-Bids are received for a sub-trade, and the Bid prices are not reasonable for acceptance without further competition.

9.8 If the Awarding Authority decides to reject all General Bids or if the Awarding Authority does not receive any general Bids, the Awarding Authority may retain and use the Sub-Bids received for a second opening of general Bids; provided, however, that there are no changes in the work involved for the subtrades for which the sub-Bids are so retained and used; and provided, further, that the Awarding Authority shall obtain the consent of each sub-Bidder included in any award of a general Contract made pursuant to the second opening of general Bids if such award is not made within ninety days, Saturdays, Sundays and legal holidays excluded, after the opening of such sub-Bids.

SECTION 10 - EXECUTION OF CONTRACTS

10.1 If a selected filed sub-Bidder fails, within five days, Saturdays, Sundays and legal holidays excluded, after presentation of a Subcontract by the general Bidder to which the Contract was awarded, to perform its agreement to execute a Subcontract in the form provided by the Awarding Authority with such general Bidder contingent upon the execution of the general Contract, and, if requested to do so by such general Bidder in the general Bid, to furnish a performance and a payment bond as stated in its filed sub-Bid, such general Bidder and the Awarding Authority shall

select from the other filed sub-Bids duly filed with the Awarding Authority for such subtrade and not rejected the lowest responsible and eligible filed sub-Bidder at the amount named in its filed sub-Bid as so filed against whose standing and ability the general Contractor makes no objection, and the Contract price shall be adjusted by the difference between the amount of such filed sub-bid and the amount of the sub-bid of the delinquent filed sub-Bidder.

10.2 Upon receipt of the Award, the general Bidder awarded the Contract shall submit properly executed originals of each of the following documents prior to execution of the Contract by the Awarding Authority. All such documents shall be in the form prescribed by the Awarding Authority.

1. Owner-Contractor Agreement
2. 100% Performance and 100% Payment Bonds with power of attorney attached
3. Certificates of Insurance evidencing coverages in amounts required by the Contract Documents
4. If applicable, written representation by the General Contractor to the effect that it has presented subcontracts to all selected filed sub-Bidders and a statement as to whether or not each such selected filed sub-Bidder has executed its subcontract such that the Awarding Authority may release the Bid deposit with respect to the same. **Misrepresentation of the foregoing shall render the general Contractor liable to the Awarding Authority for the sum of any Bid deposit released by the Awarding Authority with respect to a filed sub-Bidder that fails to execute its subcontract.**

5. Any other documents that the Awarding Authority may reasonably require in connection with the Contractor's execution of the Contract.

10.3 Please note that **NO part of the General Contractor's work may be subcontracted without the prior written approval of the Awarding Authority.** If the General Contractor desires to subcontract any part of the Work, other than work covered by Item 2, filed sub-Bidders, the General Contractor must promptly forward to the Awarding Authority a list in triplicate designating the work to be performed and the name of each proposed subcontractor for approval by the Awarding Authority. Approved subcontractors are eligible for direct payments under M.GL. 30, § 39F, as amended. Material suppliers not involving site labor need not be submitted for approval.

SECTION 11 - RETURN OF BID DEPOSITS

11.1 If no award is made, upon the expiration of the time prescribed in M.G.L. c. 149, § 44A for making an award; except that, if any general Bidder fails to perform its agreement to execute the Contract and furnish 100% Performance and 100% Payment Bond as stated in its Bid, then said general Bidder's Bid deposit shall become the property of the Commonwealth as liquidated damages; provided that the amount of the Bid deposit that becomes the property of the Commonwealth shall not exceed the difference between the Contractor's Bid price and the Bid price of the next lowest responsible and eligible Bidder; and provided further that, in the case of death, disability, bona fide clerical or mechanical error of a substantial nature, or other similar unforeseen circumstances affecting the general Bidder, such general Bidder's Bid deposit shall be returned.

11.2 If a selected sub-Bidder fails to perform its agreement to execute a sub-contract with the general Bidder selected as the general Contractor, contingent upon the execution of the General Contract, and, if requested to do so in the general Bid by such general Bidder, to furnish a

Performance and Payment Bonds as stated in its sub-Bid in accordance with M.G.L. c. 149, § 44F(2), the Bid deposit of such sub-Bidder shall become the property of the Commonwealth as liquidated damages, provided that the amount of the Bid deposit that shall become the property of the Commonwealth shall not exceed the difference between its sub-Bid price and the sub-Bid price of the next lowest responsible and eligible sub-Bidder.

11.3 In addition to the provisions for the return of Bid deposits as provided above, upon receipt of a Bid Bond in an amount not less than the amount of the required Bid deposit, the Awarding Authority shall return any Bid deposit of a Bidder forthwith after the public opening of Bids.

MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: Department of Mental Health

Contract Number: 2024-067A **City/Town:** FALL RIVER

Description of Work: Remove existing gen sets and replacement with new 400kw generator with associated panels.

Job Location: 49 Hillside St, Fall River, MA

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.
- This annual update requirement is generally not applicable to 27F "rental of equipment" contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheets form DLS and provide them to the contractor.
- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27.The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Issue Date: 01/08/2025 **Wage Request Number:** 20250108-040

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$39.95	$15.57	$20.17	$0.00	$75.69
	06/01/2025	$40.95	$15.57	$20.17	$0.00	$76.69
	12/01/2025	$40.95	$15.57	$21.78	$0.00	$78.30
	01/01/2026	$40.95	$16.17	$21.78	$0.00	$78.90
	06/01/2026	$41.95	$16.17	$21.78	$0.00	$79.90
	12/01/2026	$41.95	$16.17	$23.52	$0.00	$81.64
	01/01/2027	$41.95	$16.77	$23.52	$0.00	$82.24
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.02	$15.57	$20.17	$0.00	$75.76
	06/01/2025	$41.02	$15.57	$20.17	$0.00	$76.76
	12/01/2025	$41.02	$15.57	$21.78	$0.00	$78.37
	01/01/2026	$41.02	$16.17	$21.78	$0.00	$78.97
	06/01/2026	$42.02	$16.17	$21.78	$0.00	$79.97
	12/01/2026	$42.02	$16.17	$23.52	$0.00	$81.71
	01/01/2027	$42.02	$16.77	$23.52	$0.00	$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.14	$15.57	$20.17	$0.00	$75.88
	06/01/2025	$41.14	$15.57	$20.17	$0.00	$76.88
	12/01/2025	$41.14	$15.57	$21.78	$0.00	$78.49
	01/01/2026	$41.14	$16.17	$21.78	$0.00	$79.09
	06/01/2026	$42.14	$16.17	$21.78	$0.00	$80.09
	12/01/2026	$42.14	$16.17	$23.52	$0.00	$81.83
	01/01/2027	$42.14	$16.77	$23.52	$0.00	$82.43
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$117.16	$10.08	$24.29	$0.00	$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.61	$9.65	$17.70	$0.00	$67.96
	06/01/2025	$42.00	$9.65	$17.70	$0.00	$69.35
	12/01/2025	$43.38	$9.65	$17.70	$0.00	$70.73
	06/01/2026	$44.82	$9.65	$17.70	$0.00	$72.17
	12/01/2026	$46.26	$9.65	$17.70	$0.00	$73.61
	06/01/2027	$47.71	$9.65	$17.70	$0.00	$75.06
	12/01/2027	$49.16	$9.65	$17.70	$0.00	$76.51
	06/01/2028	$50.66	$9.65	$17.70	$0.00	$78.01
	12/01/2028	$52.16	$9.65	$17.70	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.61	$9.65	$17.80	$0.00	$68.06
	06/01/2025	$42.00	$9.65	$17.80	$0.00	$69.45
	12/01/2025	$43.38	$9.65	$17.80	$0.00	$70.83
	06/01/2026	$44.82	$9.65	$17.80	$0.00	$72.27
	12/01/2026	$46.26	$9.65	$17.80	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	12/01/2024	$42.80	$14.50	$11.05	$0.00	$68.35
	06/01/2025	$43.80	$14.50	$11.05	$0.00	$69.35
	12/01/2025	$44.80	$14.50	$11.05	$0.00	$70.35

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	12/01/2024	$40.61	$9.65	$17.70	$0.00	$67.96
	06/01/2025	$42.00	$9.65	$17.70	$0.00	$69.35
	12/01/2025	$43.38	$9.65	$17.70	$0.00	$70.73
	06/01/2026	$44.82	$9.65	$17.70	$0.00	$72.17
	12/01/2026	$46.26	$9.65	$17.70	$0.00	$73.61
	06/01/2027	$47.71	$9.65	$17.70	$0.00	$75.06
	12/01/2027	$49.16	$9.65	$17.70	$0.00	$76.51
	06/01/2028	$50.66	$9.65	$17.70	$0.00	$78.01
	12/01/2028	$52.16	$9.65	$17.70	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.61	$9.65	$17.80	$0.00	$68.06
	06/01/2025	$42.00	$9.65	$17.80	$0.00	$69.45
	12/01/2025	$43.38	$9.65	$17.80	$0.00	$70.83
	06/01/2026	$44.82	$9.65	$17.80	$0.00	$72.27
	12/01/2026	$46.26	$9.65	$17.80	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2024	$48.12	$7.07	$20.60	$0.00	$75.79

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$31.28	$7.07	$13.22	$0.00	$51.57
2	65	$31.28	$7.07	$13.22	$0.00	$51.57
3	70	$33.68	$7.07	$14.23	$0.00	$54.98
4	75	$36.09	$7.07	$15.24	$0.00	$58.40
5	80	$38.50	$7.07	$16.25	$0.00	$61.82
6	85	$40.90	$7.07	$17.28	$0.00	$65.25
7	90	$43.31	$7.07	$18.28	$0.00	$68.66
8	95	$45.71	$7.07	$19.32	$0.00	$72.10

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	08/01/2024	$64.50	$11.49	$23.59	$0.00	$99.58
	02/01/2025	$65.80	$11.49	$23.59	$0.00	$100.88
	08/01/2025	$67.95	$11.49	$23.59	$0.00	$103.03
	02/01/2026	$69.30	$11.49	$23.59	$0.00	$104.38
	08/01/2026	$71.50	$11.49	$23.59	$0.00	$106.58
	02/01/2027	$72.90	$11.49	$23.59	$0.00	$107.98

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 New Bedford*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.25	$11.49	$23.59	$0.00	$67.33
2	60	$38.70	$11.49	$23.59	$0.00	$73.78
3	70	$45.15	$11.49	$23.59	$0.00	$80.23
4	80	$51.60	$11.49	$23.59	$0.00	$86.68
5	90	$58.05	$11.49	$23.59	$0.00	$93.13

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.90	$11.49	$23.59	$0.00	$67.98
2	60	$39.48	$11.49	$23.59	$0.00	$74.56
3	70	$46.06	$11.49	$23.59	$0.00	$81.14
4	80	$52.64	$11.49	$23.59	$0.00	$87.72
5	90	$59.22	$11.49	$23.59	$0.00	$94.30

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$48.10	$9.65	$18.22	$0.00	$75.97
	06/01/2025	$49.60	$9.65	$18.22	$0.00	$77.47
	12/01/2025	$51.10	$9.65	$18.22	$0.00	$78.97
	06/01/2026	$52.65	$9.65	$18.22	$0.00	$80.52
	12/01/2026	$54.15	$9.65	$18.22	$0.00	$82.02
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.95	$9.65	$18.22	$0.00	$74.82
	06/01/2025	$48.45	$9.65	$18.22	$0.00	$76.32
	12/01/2025	$49.95	$9.65	$18.22	$0.00	$77.82
	06/01/2026	$51.50	$9.65	$18.22	$0.00	$79.37
	12/01/2026	$53.00	$9.65	$18.22	$0.00	$80.87
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$47.28	$9.65	$18.22	$0.00	$75.15
	06/01/2025	$48.78	$9.65	$18.22	$0.00	$76.65
	12/01/2025	$50.28	$9.65	$18.22	$0.00	$78.15
	06/01/2026	$51.83	$9.65	$18.22	$0.00	$79.70
	12/01/2026	$53.33	$9.65	$18.22	$0.00	$81.20
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
LABORERS - ZONE 2	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
CARPENTER	09/01/2024	$48.37	$9.83	$19.97	$0.00	$78.17
CARPENTERS -ZONE 2 (Eastern Massachusetts)	03/01/2025	$49.62	$9.83	$19.97	$0.00	$79.42
	09/01/2025	$50.87	$9.83	$19.97	$0.00	$80.67
	03/01/2026	$52.12	$9.83	$19.97	$0.00	$81.92
	09/01/2026	$53.37	$9.83	$19.97	$0.00	$83.17
	03/01/2027	$54.62	$9.83	$19.97	$0.00	$84.42

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$21.77	$9.83	$1.73	$0.00	$33.33
2	45	$21.77	$9.83	$1.73	$0.00	$33.33
3	55	$26.60	$9.83	$3.40	$0.00	$39.83
4	55	$26.60	$9.83	$3.40	$0.00	$39.83
5	70	$33.86	$9.83	$16.51	$0.00	$60.20
6	70	$33.86	$9.83	$16.51	$0.00	$60.20
7	80	$38.70	$9.83	$18.24	$0.00	$66.77
8	80	$38.70	$9.83	$18.24	$0.00	$66.77

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$22.33	$9.83	$1.73	$0.00	$33.89
2	45	$22.33	$9.83	$1.73	$0.00	$33.89
3	55	$27.29	$9.83	$3.40	$0.00	$40.52
4	55	$27.29	$9.83	$3.40	$0.00	$40.52
5	70	$34.73	$9.83	$16.51	$0.00	$61.07
6	70	$34.73	$9.83	$16.51	$0.00	$61.07
7	80	$39.70	$9.83	$18.24	$0.00	$67.77
8	80	$39.70	$9.83	$18.24	$0.00	$67.77

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARPENTER WOOD FRAME *CARPENTERS-ZONE 3 (Wood Frame)*	10/01/2024	$26.65	$7.02	$4.80	$0.00	$38.47
	10/01/2025	$27.75	$7.02	$4.80	$0.00	$39.57
	10/01/2026	$28.85	$7.02	$4.80	$0.00	$40.67

All Aspects of New Wood Frame Work

Apprentice - *CARPENTER (Wood Frame) - Zone 3*

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$15.99	$7.02	$0.00	$0.00	$23.01
2	60	$15.99	$7.02	$0.00	$0.00	$23.01
3	65	$17.32	$7.02	$1.00	$0.00	$25.34
4	70	$18.66	$7.02	$1.00	$0.00	$26.68
5	75	$19.99	$7.02	$4.80	$0.00	$31.81
6	80	$21.32	$7.02	$4.80	$0.00	$33.14
7	85	$22.65	$7.02	$4.80	$0.00	$34.47
8	90	$23.99	$7.02	$4.80	$0.00	$35.81

Effective Date - 10/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$16.65	$7.02	$0.00	$0.00	$23.67
2	60	$16.65	$7.02	$0.00	$0.00	$23.67
3	65	$18.04	$7.02	$1.00	$0.00	$26.06
4	70	$19.43	$7.02	$1.00	$0.00	$27.45
5	75	$20.81	$7.02	$4.80	$0.00	$32.63
6	80	$22.20	$7.02	$4.80	$0.00	$34.02
7	85	$23.59	$7.02	$4.80	$0.00	$35.41
8	90	$24.98	$7.02	$4.80	$0.00	$36.80

Notes:

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	01/01/2024	$49.33	$13.00	$23.57	$1.30	$87.20

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CEMENT MASONRY/PLASTERING - Eastern Mass (New Bedford)*

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.67	$13.00	$15.93	$0.00	$53.60
2	60	$29.60	$13.00	$18.57	$1.30	$62.47
3	65	$32.06	$13.00	$19.57	$1.30	$65.93
4	70	$34.53	$13.00	$20.57	$1.30	$69.40
5	75	$37.00	$13.00	$21.57	$1.30	$72.87
6	80	$39.46	$13.00	$22.57	$1.30	$76.33
7	90	$44.40	$13.00	$23.57	$1.30	$82.27

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$58.18	$15.55	$16.50	$0.00	$90.23
	06/01/2025	$59.51	$15.55	$16.50	$0.00	$91.56
	12/01/2025	$60.98	$15.55	$16.50	$0.00	$93.03
	06/01/2026	$62.31	$15.55	$16.50	$0.00	$94.36
	12/01/2026	$63.79	$15.55	$16.50	$0.00	$95.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$29.23	$9.95	$0.00	$0.00	$39.18
2	55	$32.15	$9.95	$6.66	$0.00	$48.76
3	60	$35.08	$9.95	$7.26	$0.00	$52.29
4	65	$38.00	$9.95	$7.87	$0.00	$55.82
5	70	$40.92	$9.95	$20.32	$0.00	$71.19
6	75	$43.85	$9.95	$20.93	$0.00	$74.73
7	80	$46.77	$9.95	$21.53	$0.00	$78.25
8	90	$52.61	$9.95	$22.74	$0.00	$85.30

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	12/02/2024	$47.00	$9.65	$18.40	$0.00	$75.05
	06/02/2025	$48.50	$9.65	$18.40	$0.00	$76.55
	12/01/2025	$50.00	$9.65	$18.40	$0.00	$78.05
	06/01/2026	$51.55	$9.65	$18.40	$0.00	$79.60
	12/07/2026	$53.05	$9.65	$18.40	$0.00	$81.10
	06/07/2027	$54.65	$9.65	$18.40	$0.00	$82.70
	12/06/2027	$56.25	$9.65	$18.40	$0.00	$84.30
	06/05/2028	$57.93	$9.65	$18.40	$0.00	$85.98
	12/04/2028	$59.60	$9.65	$18.40	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	12/02/2024	$48.00	$9.65	$18.40	$0.00	$76.05
	06/02/2025	$49.50	$9.65	$18.40	$0.00	$77.55
	12/01/2025	$51.00	$9.65	$18.40	$0.00	$79.05
	06/01/2026	$52.55	$9.65	$18.40	$0.00	$80.60
	12/07/2026	$54.05	$9.65	$18.40	$0.00	$82.10
	06/07/2027	$55.65	$9.65	$18.40	$0.00	$83.70
	12/06/2027	$57.25	$9.65	$18.40	$0.00	$85.30
	06/05/2028	$58.93	$9.65	$18.40	$0.00	$86.98
	12/04/2028	$60.60	$9.65	$18.40	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS *LABORERS - ZONE 2*	12/02/2024	$47.75	$9.65	$18.40	$0.00	$75.80
	06/02/2025	$49.25	$9.65	$18.40	$0.00	$77.30
	12/01/2025	$50.75	$9.65	$18.40	$0.00	$78.80
	06/01/2026	$52.30	$9.65	$18.40	$0.00	$80.35
	12/07/2026	$53.80	$9.65	$18.40	$0.00	$81.85
	06/07/2027	$55.40	$9.65	$18.40	$0.00	$83.45
	12/06/2027	$57.00	$9.65	$18.40	$0.00	$85.05
	06/05/2028	$58.68	$9.65	$18.40	$0.00	$86.73
	12/04/2028	$60.35	$9.65	$18.40	$0.00	$88.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	12/02/2024	$48.00	$9.65	$18.40	$0.00	$76.05
	06/02/2025	$49.50	$9.65	$18.40	$0.00	$77.55
	12/01/2025	$51.00	$9.65	$18.40	$0.00	$79.05
	06/01/2026	$52.55	$9.65	$18.40	$0.00	$80.60
	12/07/2026	$54.05	$9.65	$18.40	$0.00	$82.10
	06/07/2027	$55.65	$9.65	$18.40	$0.00	$83.70
	12/06/2027	$57.25	$9.65	$18.40	$0.00	$85.30
	06/05/2028	$58.93	$9.65	$18.40	$0.00	$86.98
	12/04/2028	$60.60	$9.65	$18.40	$0.00	$88.65
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	12/02/2024	$47.75	$9.65	$18.40	$0.00	$75.80
	06/02/2025	$49.25	$9.65	$18.40	$0.00	$77.30
	12/01/2025	$50.75	$9.65	$18.40	$0.00	$78.80
	06/01/2026	$52.30	$9.65	$18.40	$0.00	$80.35
	12/07/2026	$53.80	$9.65	$18.40	$0.00	$81.85
	06/07/2027	$55.40	$9.65	$18.40	$0.00	$83.45
	12/06/2027	$57.00	$9.65	$18.40	$0.00	$85.05
	06/05/2028	$58.68	$9.65	$18.40	$0.00	$86.73
	12/04/2028	$60.35	$9.65	$18.40	$0.00	$88.40
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	12/02/2024	$47.00	$9.65	$18.40	$0.00	$75.05
	06/02/2025	$48.50	$9.65	$18.40	$0.00	$76.55
	12/01/2025	$50.00	$9.65	$18.40	$0.00	$78.05
	06/01/2026	$51.55	$9.65	$18.40	$0.00	$79.60
	12/07/2026	$53.05	$9.65	$18.40	$0.00	$81.10
	06/07/2027	$54.65	$9.65	$18.40	$0.00	$82.70
	12/06/2027	$56.25	$9.65	$18.40	$0.00	$84.30
	06/05/2028	$57.93	$9.65	$18.40	$0.00	$85.98
	12/04/2028	$59.60	$9.65	$18.40	$0.00	$87.65
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$78.11	$10.08	$24.29	$0.00	$112.48
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A $69.83, 3A $91.79,4A $102.14 Total Rate						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A $54.20, 3A $73.93,4A $82.05 Total Rate						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$83.69	$10.08	$24.29	$0.00	$118.06
For apprentice rates see "Apprentice- PILE DRIVER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 2)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2024	$117.16	$10.08	$24.29	$0.00	$151.53
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78

Apprentice - *ELECTRICIAN - Local 223*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$20.01	$12.00	$0.60	$0.00	$32.61
2	45	$22.51	$12.00	$0.68	$0.00	$35.19
3	50	$25.01	$12.00	$0.75	$0.00	$37.76
4	55	$27.51	$12.00	$8.59	$0.00	$48.10
5	60	$30.01	$12.00	$9.15	$0.00	$51.16
6	65	$32.51	$12.00	$9.74	$0.00	$54.25
7	70	$35.01	$12.00	$10.30	$0.00	$57.31
8	75	$37.52	$12.00	$10.89	$0.00	$60.41

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$20.90	$12.25	$0.63	$0.00	$33.78
2	45	$23.51	$12.25	$0.71	$0.00	$36.47
3	50	$26.13	$12.25	$0.78	$0.00	$39.16
4	55	$28.74	$12.25	$9.11	$0.00	$50.10
5	60	$31.35	$12.25	$9.71	$0.00	$53.31
6	65	$33.96	$12.25	$10.32	$0.00	$56.53
7	70	$36.58	$12.25	$10.91	$0.00	$59.74
8	75	$39.19	$12.25	$11.52	$0.00	$62.96

Notes:

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2022	$65.62	$16.03	$20.21	$0.00	$101.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.81	$16.03	$0.00	$0.00	$48.84
2	55	$36.09	$16.03	$20.21	$0.00	$72.33
3	65	$42.65	$16.03	$20.21	$0.00	$78.89
4	70	$45.93	$16.03	$20.21	$0.00	$82.17
5	80	$52.50	$16.03	$20.21	$0.00	$88.74

Notes:
Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$51.78	$15.30	$16.40	$0.00	$83.48
	05/01/2025	$53.22	$15.30	$16.40	$0.00	$84.92
	11/01/2025	$54.51	$15.30	$16.40	$0.00	$86.21
	05/01/2026	$55.95	$15.30	$16.40	$0.00	$87.65
	11/01/2026	$57.24	$15.30	$16.40	$0.00	$88.94
	05/01/2027	$58.67	$15.30	$16.40	$0.00	$90.37
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$53.37	$15.30	$16.40	$0.00	$85.07
	05/01/2025	$54.82	$15.30	$16.40	$0.00	$86.52
	11/01/2025	$56.12	$15.30	$16.40	$0.00	$87.82
	05/01/2026	$57.57	$15.30	$16.40	$0.00	$89.27
	11/01/2026	$58.87	$15.30	$16.40	$0.00	$90.57
	05/01/2027	$60.32	$15.30	$16.40	$0.00	$92.02
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2024	$25.37	$15.30	$16.40	$0.00	$57.07
	05/01/2025	$26.22	$15.30	$16.40	$0.00	$57.92
	11/01/2025	$26.98	$15.30	$16.40	$0.00	$58.68
	05/01/2026	$27.83	$15.30	$16.40	$0.00	$59.53
	11/01/2026	$28.59	$15.30	$16.40	$0.00	$60.29
	05/01/2027	$29.44	$15.30	$16.40	$0.00	$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING *ELECTRICIANS LOCAL 223*	09/01/2024	$42.52	$12.00	$15.30	$0.00	$69.82
	09/01/2025	$44.41	$12.25	$16.09	$0.00	$72.75
	09/01/2026	$46.51	$12.50	$16.93	$0.00	$75.94
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$45.96	$15.55	$16.50	$0.00	$78.01
	06/01/2025	$47.02	$15.55	$16.50	$0.00	$79.07
	12/01/2025	$48.19	$15.55	$16.50	$0.00	$80.24
	06/01/2026	$49.25	$15.55	$16.50	$0.00	$81.30
	12/01/2026	$50.43	$15.55	$16.50	$0.00	$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$27.01	$9.65	$17.80	$0.00	$54.46
	06/01/2025	$28.09	$9.65	$17.80	$0.00	$55.54
	12/01/2025	$28.09	$9.65	$17.80	$0.00	$55.54
	06/01/2026	$29.21	$9.65	$17.80	$0.00	$56.66
	12/01/2026	$29.21	$9.65	$17.80	$0.00	$56.66
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	09/01/2024	$56.23	$8.83	$20.27	$0.00	$85.33
	03/01/2025	$57.73	$8.83	$20.27	$0.00	$86.83
	09/01/2025	$59.23	$8.83	$20.27	$0.00	$88.33
	03/01/2026	$60.73	$8.83	$20.27	$0.00	$89.83
	09/01/2026	$62.23	$8.83	$20.27	$0.00	$91.33
	03/01/2027	$63.73	$8.83	$20.27	$0.00	$92.83

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$25.30	$8.83	$1.76	$0.00	$35.89
2	45	$25.30	$8.83	$1.76	$0.00	$35.89
3	55	$30.93	$8.83	$3.52	$0.00	$43.28
4	55	$30.93	$8.83	$3.52	$0.00	$43.28
5	70	$39.36	$8.83	$16.75	$0.00	$64.94
6	70	$39.36	$8.83	$16.75	$0.00	$64.94
7	80	$44.98	$8.83	$18.51	$0.00	$72.32
8	80	$44.98	$8.83	$18.51	$0.00	$72.32

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$25.98	$8.83	$1.76	$0.00	$36.57
2	45	$25.98	$8.83	$1.76	$0.00	$36.57
3	55	$31.75	$8.83	$3.52	$0.00	$44.10
4	55	$31.75	$8.83	$3.52	$0.00	$44.10
5	70	$40.41	$8.83	$16.75	$0.00	$65.99
6	70	$40.41	$8.83	$16.75	$0.00	$65.99
7	80	$46.18	$8.83	$18.51	$0.00	$73.52
8	80	$46.18	$8.83	$18.51	$0.00	$73.52

Notes: Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 1333*	06/01/2020	$39.18	$10.80	$10.45	$0.00	$60.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 1333*

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.59	$10.80	$1.80	$0.00	$32.19
2	56	$22.04	$10.80	$1.80	$0.00	$34.64
3	63	$24.49	$10.80	$2.45	$0.00	$37.74
4	69	$26.94	$10.80	$2.45	$0.00	$40.19
5	75	$29.39	$10.80	$3.15	$0.00	$43.34
6	81	$31.83	$10.80	$3.15	$0.00	$45.78
7	88	$34.28	$10.80	$10.45	$0.00	$55.53
8	94	$36.73	$10.80	$10.45	$0.00	$57.98

Notes:

Apprentice to Journeyworker Ratio:1:3

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$31.37	$0.00	$0.00	$0.00	$31.37
2	60	$34.22	$15.55	$16.50	$0.00	$66.27
3	65	$37.07	$15.55	$16.50	$0.00	$69.12
4	70	$39.92	$15.55	$16.50	$0.00	$71.97
5	75	$42.77	$15.55	$16.50	$0.00	$74.82
6	80	$45.62	$15.55	$16.50	$0.00	$77.67
7	85	$48.48	$15.55	$16.50	$0.00	$80.53
8	90	$51.33	$15.55	$16.50	$0.00	$83.38

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$32.08	$0.00	$0.00	$0.00	$32.08
2	60	$35.00	$15.55	$16.50	$0.00	$67.05
3	65	$37.91	$15.55	$16.50	$0.00	$69.96
4	70	$40.83	$15.55	$16.50	$0.00	$72.88
5	75	$43.75	$15.55	$16.50	$0.00	$75.80
6	80	$46.66	$15.55	$16.50	$0.00	$78.71
7	85	$49.58	$15.55	$16.50	$0.00	$81.63
8	90	$52.50	$15.55	$16.50	$0.00	$84.55

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - B*	10/01/2024	$42.33	$14.59	$19.04	$2.24	$78.20
	04/01/2025	$43.83	$14.59	$19.04	$2.24	$79.70
	10/01/2025	$45.08	$14.59	$19.04	$2.24	$80.95
	04/01/2026	$46.58	$14.59	$19.04	$2.24	$82.45
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 223*	09/01/2024	$50.02	$12.00	$17.72	$0.00	$79.74
	09/01/2025	$52.25	$12.25	$18.61	$0.00	$83.11
	09/01/2026	$54.72	$12.50	$19.56	$0.00	$86.78
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - B*	10/01/2024	$42.33	$30.43	$19.04	$2.24	$94.04
	04/01/2025	$43.83	$30.43	$19.04	$2.24	$95.54
	10/01/2025	$45.08	$30.43	$19.04	$2.24	$96.79
	04/01/2026	$46.58	$30.43	$19.04	$2.24	$98.29
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC MECHANIC *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS *LABORERS - ZONE 2*	12/01/2024	$40.61	$9.65	$17.70	$0.00	$67.96
	06/01/2025	$42.00	$9.65	$17.70	$0.00	$69.35
	12/01/2025	$43.38	$9.65	$17.70	$0.00	$70.73
	06/01/2026	$44.82	$9.65	$17.70	$0.00	$72.17
	12/01/2026	$46.26	$9.65	$17.70	$0.00	$73.61
	06/01/2027	$47.71	$9.65	$17.70	$0.00	$75.06
	12/01/2027	$49.16	$9.65	$17.70	$0.00	$76.51
	06/01/2028	$50.66	$9.65	$17.70	$0.00	$78.01
	12/01/2028	$52.16	$9.65	$17.70	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.61	$9.65	$17.80	$0.00	$68.06
	06/01/2025	$42.00	$9.65	$17.80	$0.00	$69.45
	12/01/2025	$43.38	$9.65	$17.80	$0.00	$70.83
	06/01/2026	$44.82	$9.65	$17.80	$0.00	$72.27
	12/01/2026	$46.26	$9.65	$17.80	$0.00	$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	09/01/2024	$51.23	$14.75	$19.61	$0.00	$85.59
	09/01/2025	$54.31	$14.75	$19.61	$0.00	$88.67
	09/01/2026	$57.38	$14.75	$19.61	$0.00	$91.74

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Southern MA*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.62	$14.75	$14.32	$0.00	$54.69
2	60	$30.74	$14.75	$15.37	$0.00	$60.86
3	70	$35.86	$14.75	$16.43	$0.00	$67.04
4	80	$40.98	$14.75	$17.49	$0.00	$73.22

Effective Date - 09/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.16	$14.75	$14.32	$0.00	$56.23
2	60	$32.59	$14.75	$15.37	$0.00	$62.71
3	70	$38.02	$14.75	$16.43	$0.00	$69.20
4	80	$43.45	$14.75	$17.49	$0.00	$75.69

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 37*	03/16/2021	$42.46	$7.70	$17.10	$0.00	$67.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 37*

Effective Date - 03/16/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	$29.72	$7.70	$17.10	$0.00	$54.52
2	75	$31.85	$7.70	$17.10	$0.00	$56.65
3	80	$33.97	$7.70	$17.10	$0.00	$58.77
4	85	$36.09	$7.70	$17.10	$0.00	$60.89
5	90	$38.21	$7.70	$17.10	$0.00	$63.01
6	95	$40.34	$7.70	$17.10	$0.00	$65.14

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	12/01/2024	$39.86	$9.65	$17.70	$0.00	$67.21
	06/01/2025	$41.25	$9.65	$17.70	$0.00	$68.60
	12/01/2025	$42.63	$9.65	$17.70	$0.00	$69.98
	06/01/2026	$44.07	$9.65	$17.70	$0.00	$71.42
	12/01/2026	$45.51	$9.65	$17.70	$0.00	$72.86
	06/01/2027	$46.96	$9.65	$17.70	$0.00	$74.31
	12/01/2027	$48.41	$9.65	$17.70	$0.00	$75.76
	06/01/2028	$49.91	$9.65	$17.70	$0.00	$77.26
	12/01/2028	$51.41	$9.65	$17.70	$0.00	$78.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER - Zone 2*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.92	$9.65	$17.70	$0.00	$51.27
2	70	$27.90	$9.65	$17.70	$0.00	$55.25
3	80	$31.89	$9.65	$17.70	$0.00	$59.24
4	90	$35.87	$9.65	$17.70	$0.00	$63.22

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.75	$9.65	$17.70	$0.00	$52.10
2	70	$28.88	$9.65	$17.70	$0.00	$56.23
3	80	$33.00	$9.65	$17.70	$0.00	$60.35
4	90	$37.13	$9.65	$17.70	$0.00	$64.48

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.86	$9.65	$17.80	$0.00	$67.31
	06/01/2025	$41.25	$9.65	$17.80	$0.00	$68.70
	12/01/2025	$42.63	$9.65	$17.80	$0.00	$70.08
	06/01/2026	$44.07	$9.65	$17.80	$0.00	$71.52
	12/01/2026	$45.51	$9.65	$17.80	$0.00	$72.96

Apprentice - *LABORER (Heavy & Highway) - Zone 2*

Effective Date - 12/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$23.92	$9.65	$17.80	$0.00	$51.37
2	70	$27.90	$9.65	$17.80	$0.00	$55.35
3	80	$31.89	$9.65	$17.80	$0.00	$59.34
4	90	$35.87	$9.65	$17.80	$0.00	$63.32

Effective Date - 06/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$24.75	$9.65	$17.80	$0.00	$52.20
2	70	$28.88	$9.65	$17.80	$0.00	$56.33
3	80	$33.00	$9.65	$17.80	$0.00	$60.45
4	90	$37.13	$9.65	$17.80	$0.00	$64.58

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	12/01/2024	$39.86	$9.65	$17.70	$0.00	$67.21
	06/01/2025	$41.25	$9.65	$17.70	$0.00	$68.60
	12/01/2025	$42.63	$9.65	$17.70	$0.00	$69.98
	06/01/2026	$44.07	$9.65	$17.70	$0.00	$71.42
	12/01/2026	$45.51	$9.65	$17.70	$0.00	$72.86
	06/01/2027	$46.96	$9.65	$17.70	$0.00	$74.31
	12/01/2027	$48.41	$9.65	$17.70	$0.00	$75.76
	06/01/2028	$49.91	$9.65	$17.70	$0.00	$77.26
	12/01/2028	$51.41	$9.65	$17.70	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	12/01/2024	$39.86	$9.65	$17.70	$0.00	$67.21
	06/01/2025	$41.25	$9.65	$17.70	$0.00	$68.60
	12/01/2025	$42.63	$9.65	$17.70	$0.00	$69.98
	06/01/2026	$44.07	$9.65	$17.70	$0.00	$71.42
	12/01/2026	$45.51	$9.65	$17.70	$0.00	$72.86
	06/01/2027	$46.96	$9.65	$17.70	$0.00	$74.31
	12/01/2027	$48.41	$9.65	$17.70	$0.00	$75.76
	06/01/2028	$49.91	$9.65	$17.70	$0.00	$77.26
	12/01/2028	$51.41	$9.65	$17.70	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	12/02/2024	$39.95	$9.65	$17.76	$0.00	$67.36
	06/02/2025	$41.34	$9.65	$17.76	$0.00	$68.75
	12/01/2025	$42.72	$9.65	$17.76	$0.00	$70.13
	06/01/2026	$44.16	$9.65	$17.76	$0.00	$71.57
	12/07/2026	$45.60	$9.65	$17.76	$0.00	$73.01
	06/07/2027	$47.05	$9.65	$17.76	$0.00	$74.46
	12/06/2027	$48.50	$9.65	$17.76	$0.00	$75.91
	06/05/2028	$50.00	$9.65	$17.76	$0.00	$77.41
	12/04/2028	$51.50	$9.65	$17.76	$0.00	$78.91
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	12/01/2024	$39.86	$9.65	$17.70	$0.00	$67.21
	06/01/2025	$41.25	$9.65	$17.70	$0.00	$68.60
	12/01/2025	$42.63	$9.65	$17.70	$0.00	$69.98
	06/01/2026	$44.07	$9.65	$17.70	$0.00	$71.42
	12/01/2026	$45.51	$9.65	$17.70	$0.00	$72.86
	06/01/2027	$46.96	$9.65	$17.70	$0.00	$74.31
	12/01/2027	$48.41	$9.65	$17.70	$0.00	$75.76
	06/01/2028	$49.91	$9.65	$17.70	$0.00	$77.26
	12/01/2028	$51.41	$9.65	$17.70	$0.00	$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	12/01/2024	$39.86	$9.65	$17.70	$0.00	$67.21
	06/01/2025	$41.25	$9.65	$17.70	$0.00	$68.60
	12/01/2025	$42.63	$9.65	$17.70	$0.00	$69.98
	06/01/2026	$44.07	$9.65	$17.70	$0.00	$71.42
	12/01/2026	$45.51	$9.65	$17.70	$0.00	$72.86
	06/01/2027	$46.96	$9.65	$17.70	$0.00	$74.31
	12/01/2027	$48.41	$9.65	$17.70	$0.00	$75.76
	06/01/2028	$49.91	$9.65	$17.70	$0.00	$77.26
	12/01/2028	$51.41	$9.65	$17.70	$0.00	$78.76
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2024	$49.32	$11.49	$21.62	$0.00	$82.43
	02/01/2025	$50.36	$11.49	$21.62	$0.00	$83.47
	08/01/2025	$52.08	$11.49	$21.62	$0.00	$85.19
	02/01/2026	$53.16	$11.49	$21.62	$0.00	$86.27
	08/01/2026	$54.92	$11.49	$21.62	$0.00	$88.03
	02/01/2027	$56.04	$11.49	$21.62	$0.00	$89.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE & TILE FINISHER - Local 3 Marble & Tile*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.66	$11.49	$21.62	$0.00	$57.77
2	60	$29.59	$11.49	$21.62	$0.00	$62.70
3	70	$34.52	$11.49	$21.62	$0.00	$67.63
4	80	$39.46	$11.49	$21.62	$0.00	$72.57
5	90	$44.39	$11.49	$21.62	$0.00	$77.50

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.18	$11.49	$21.62	$0.00	$58.29
2	60	$30.22	$11.49	$21.62	$0.00	$63.33
3	70	$35.25	$11.49	$21.62	$0.00	$68.36
4	80	$40.29	$11.49	$21.62	$0.00	$73.40
5	90	$45.32	$11.49	$21.62	$0.00	$78.43

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2024	$64.52	$11.49	$23.56	$0.00	$99.57
	02/01/2025	$65.82	$11.49	$23.56	$0.00	$100.87
	08/01/2025	$67.97	$11.49	$23.56	$0.00	$103.02
	02/01/2026	$69.32	$11.49	$23.56	$0.00	$104.37
	08/01/2026	$71.52	$11.49	$23.56	$0.00	$106.57
	02/01/2027	$72.92	$11.49	$23.56	$0.00	$107.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.26	$11.49	$23.56	$0.00	$67.31
2	60	$38.71	$11.49	$23.56	$0.00	$73.76
3	70	$45.16	$11.49	$23.56	$0.00	$80.21
4	80	$51.62	$11.49	$23.56	$0.00	$86.67
5	90	$58.07	$11.49	$23.56	$0.00	$93.12

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.91	$11.49	$23.56	$0.00	$67.96
2	60	$39.49	$11.49	$23.56	$0.00	$74.54
3	70	$46.07	$11.49	$23.56	$0.00	$81.12
4	80	$52.66	$11.49	$23.56	$0.00	$87.71
5	90	$59.24	$11.49	$23.56	$0.00	$94.29

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	01/06/2025	$45.09	$10.08	$21.47	$0.00	$76.64
	01/05/2026	$47.42	$10.08	$21.47	$0.00	$78.97

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 01/06/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$24.80	$10.08	$5.50	$0.00	$40.38
2	65	$29.31	$10.08	$6.50	$0.00	$45.89
3	75	$33.82	$10.08	$18.97	$0.00	$62.87
4	85	$38.33	$10.08	$19.97	$0.00	$68.38

Effective Date - 01/05/2026

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$26.08	$10.08	$5.50	$0.00	$41.66
2	65	$30.82	$10.08	$6.50	$0.00	$47.40
3	75	$35.57	$10.08	$18.97	$0.00	$64.62
4	85	$40.31	$10.08	$19.97	$0.00	$70.36

Notes: Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 $5.72, Step 2 $6.66)
Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:4

MORTAR MIXER *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$25.37	$15.30	$16.40	$0.00	$57.07
	06/01/2025	$25.97	$15.30	$16.40	$0.00	$57.67
	12/01/2025	$26.63	$15.30	$16.40	$0.00	$58.33
	06/01/2026	$27.22	$15.30	$16.40	$0.00	$58.92
	12/01/2026	$27.89	$15.30	$16.40	$0.00	$59.59
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$31.08	$15.30	$16.40	$0.00	$62.78
	06/01/2025	$31.80	$15.30	$16.40	$0.00	$63.50
	12/01/2025	$32.60	$15.30	$16.40	$0.00	$64.30
	06/01/2026	$33.32	$15.30	$16.40	$0.00	$65.02
	12/01/2026	$34.12	$15.30	$16.40	$0.00	$65.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$58.46	$9.95	$23.95	$0.00	$92.36

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$29.23	$9.95	$0.00	$0.00	$39.18
2	55	$32.15	$9.95	$6.66	$0.00	$48.76
3	60	$35.08	$9.95	$7.26	$0.00	$52.29
4	65	$38.00	$9.95	$7.87	$0.00	$55.82
5	70	$40.92	$9.95	$20.32	$0.00	$71.19
6	75	$43.85	$9.95	$20.93	$0.00	$74.73
7	80	$46.77	$9.95	$21.53	$0.00	$78.25
8	90	$52.61	$9.95	$22.74	$0.00	$85.30

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$49.36	$9.95	$23.95	$0.00	$83.26

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - New*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.68	$9.95	$0.00	$0.00	$34.63
2	55	$27.15	$9.95	$6.66	$0.00	$43.76
3	60	$29.62	$9.95	$7.26	$0.00	$46.83
4	65	$32.08	$9.95	$7.87	$0.00	$49.90
5	70	$34.55	$9.95	$20.32	$0.00	$64.82
6	75	$37.02	$9.95	$20.93	$0.00	$67.90
7	80	$39.49	$9.95	$21.53	$0.00	$70.97
8	90	$44.42	$9.95	$22.74	$0.00	$77.11

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$47.42	$9.95	$23.95	$0.00	$81.32

Apprentice - *PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.71	$9.95	$0.00	$0.00	$33.66
2	55	$26.08	$9.95	$6.66	$0.00	$42.69
3	60	$28.45	$9.95	$7.26	$0.00	$45.66
4	65	$30.82	$9.95	$7.87	$0.00	$48.64
5	70	$33.19	$9.95	$20.32	$0.00	$63.46
6	75	$35.57	$9.95	$20.93	$0.00	$66.45
7	80	$37.94	$9.95	$21.53	$0.00	$69.42
8	90	$42.68	$9.95	$22.74	$0.00	$75.37

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$47.96	$9.95	$23.95	$0.00	$81.86

Apprentice - *PAINTER - Local 35 Zone 2 - BRUSH NEW*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.98	$9.95	$0.00	$0.00	$33.93
2	55	$26.38	$9.95	$6.66	$0.00	$42.99
3	60	$28.78	$9.95	$7.26	$0.00	$45.99
4	65	$31.17	$9.95	$7.87	$0.00	$48.99
5	70	$33.57	$9.95	$20.32	$0.00	$63.84
6	75	$35.97	$9.95	$20.93	$0.00	$66.85
7	80	$38.37	$9.95	$21.53	$0.00	$69.85
8	90	$43.16	$9.95	$22.74	$0.00	$75.85

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2025	$46.02	$9.95	$23.95	$0.00	$79.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - BRUSH REPAINT*

Effective Date - 01/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.01	$9.95	$0.00	$0.00	$32.96
2	55	$25.31	$9.95	$6.66	$0.00	$41.92
3	60	$27.61	$9.95	$7.26	$0.00	$44.82
4	65	$29.91	$9.95	$7.87	$0.00	$47.73
5	70	$32.21	$9.95	$20.32	$0.00	$62.48
6	75	$34.52	$9.95	$20.93	$0.00	$65.40
7	80	$36.82	$9.95	$21.53	$0.00	$68.30
8	90	$41.42	$9.95	$22.74	$0.00	$74.11

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$39.86	$9.65	$17.80	$0.00	$67.31
	06/01/2025	$41.25	$9.65	$17.80	$0.00	$68.70
	12/01/2025	$42.63	$9.65	$17.80	$0.00	$70.08
	06/01/2026	$44.07	$9.65	$17.80	$0.00	$71.52
	12/01/2026	$45.51	$9.65	$17.80	$0.00	$72.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$39.78	$15.57	$20.17	$0.00	$75.52
	06/01/2025	$40.78	$15.57	$20.17	$0.00	$76.52
	12/01/2025	$40.78	$15.57	$21.78	$0.00	$78.13
	01/01/2026	$40.78	$16.17	$21.78	$0.00	$78.73
	06/01/2026	$41.78	$16.17	$21.78	$0.00	$79.73
	12/01/2026	$41.78	$16.17	$23.52	$0.00	$81.47
	01/01/2027	$41.78	$16.77	$23.52	$0.00	$82.07
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34
For apprentice rates see "Apprentice- PILE DRIVER"						
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 2)*	08/01/2024	$51.97	$10.08	$24.29	$0.00	$86.34

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 2*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	$23.39	$10.08	$2.53	$0.00	$36.00
2	55	$28.58	$10.08	$5.07	$0.00	$43.73
3	70	$36.38	$10.08	$19.22	$0.00	$65.68
4	80	$41.58	$10.08	$21.76	$0.00	$73.42

Notes:

% Indentured BEFORE 8/1/2020, 50/60/70/75/80/80/90/90
Step 1 $60.36/2 $65.75/3 $70.75/4 $73.35/5&6 $75.95/7&8 81.14

Apprentice to Journeyworker Ratio:1:5

PIPELAYER *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PLUMBER/PIPEFITTER - Local 51*

Effective Date - 08/26/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$21.90	$10.15	$2.50	$0.00	$34.55
2	50	$27.37	$10.15	$2.50	$0.00	$40.02
3	60	$32.84	$10.15	$8.80	$0.00	$51.79
4	70	$38.32	$10.15	$14.08	$0.00	$62.55
5	80	$43.79	$10.15	$17.60	$0.00	$71.54

Effective Date - 08/25/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$23.00	$10.15	$2.50	$0.00	$35.65
2	50	$28.75	$10.15	$2.50	$0.00	$41.40
3	60	$34.49	$10.15	$8.80	$0.00	$53.44
4	70	$40.24	$10.15	$14.08	$0.00	$64.47
5	80	$45.99	$10.15	$17.60	$0.00	$73.74

Notes:
Steps 2000hrs. Prior 9/1/05; 40/40/45/50/55/60/65/75/80/85

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.61	$9.65	$17.70	$0.00	$67.96
	06/01/2025	$42.00	$9.65	$17.70	$0.00	$69.35
	12/01/2025	$43.38	$9.65	$17.70	$0.00	$70.73
	06/01/2026	$44.82	$9.65	$17.70	$0.00	$72.17
	12/01/2026	$46.26	$9.65	$17.70	$0.00	$73.61
	06/01/2027	$47.71	$9.65	$17.70	$0.00	$75.06
	12/01/2027	$49.16	$9.65	$17.70	$0.00	$76.51
	06/01/2028	$50.66	$9.65	$17.70	$0.00	$78.01
	12/01/2028	$52.16	$9.65	$17.70	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER *LABORERS - ZONE 2*	12/01/2024	$40.86	$9.65	$17.70	$0.00	$68.21
	06/01/2025	$42.25	$9.65	$17.70	$0.00	$69.60
	12/01/2025	$43.63	$9.65	$17.70	$0.00	$70.98
	06/01/2026	$45.07	$9.65	$17.70	$0.00	$72.42
	12/01/2026	$46.51	$9.65	$17.70	$0.00	$73.86
	06/01/2027	$47.96	$9.65	$17.70	$0.00	$75.31
	12/01/2027	$49.41	$9.65	$17.70	$0.00	$76.76
	06/01/2028	$50.91	$9.65	$17.70	$0.00	$78.26
	12/01/2028	$52.41	$9.65	$17.70	$0.00	$79.76
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2024	$40.86	$9.40	$17.55	$0.00	$67.81
	06/01/2025	$42.25	$9.40	$17.55	$0.00	$69.20
	12/01/2025	$43.63	$9.40	$17.55	$0.00	$70.58
	06/01/2026	$45.07	$9.40	$17.55	$0.00	$72.02
	12/01/2026	$46.51	$9.40	$17.55	$0.00	$73.46
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$36.67	$15.55	$16.50	$0.00	$68.72
	06/01/2025	$37.52	$15.55	$16.50	$0.00	$69.57
	12/01/2025	$38.47	$15.55	$16.50	$0.00	$70.52
	06/01/2026	$39.33	$15.55	$16.50	$0.00	$71.38
	12/01/2026	$40.28	$15.55	$16.50	$0.00	$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 170 - Dauphinais (Bellingham)*	01/01/2025	$27.60	$11.26	$6.15	$0.00	$45.01
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 2*	12/01/2024	$40.11	$9.65	$17.70	$0.00	$67.46
	06/01/2025	$41.50	$9.65	$17.70	$0.00	$68.85
	12/01/2025	$42.88	$9.65	$17.70	$0.00	$70.23
	06/01/2026	$44.32	$9.65	$17.70	$0.00	$71.67
	12/01/2026	$45.76	$9.65	$17.70	$0.00	$73.11
	06/01/2027	$47.21	$9.65	$17.70	$0.00	$74.56
	12/01/2027	$48.66	$9.65	$17.70	$0.00	$76.01
	06/01/2028	$50.16	$9.65	$17.70	$0.00	$77.51
	12/01/2028	$51.66	$9.65	$17.70	$0.00	$79.01
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	08/01/2024	$51.03	$13.03	$21.70	$0.00	$85.76
	02/01/2025	$52.28	$13.03	$21.70	$0.00	$87.01
	08/01/2025	$53.78	$13.03	$21.70	$0.00	$88.51
	02/01/2026	$55.03	$13.03	$21.70	$0.00	$89.76

Apprentice - *ROOFER - Local 33*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.52	$13.03	$6.52	$0.00	$45.07
2	60	$30.62	$13.03	$21.70	$0.00	$65.35
3	65	$33.17	$13.03	$21.70	$0.00	$67.90
4	75	$38.27	$13.03	$21.70	$0.00	$73.00
5	85	$43.38	$13.03	$21.70	$0.00	$78.11

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.14	$13.03	$6.52	$0.00	$45.69
2	60	$31.37	$13.03	$21.70	$0.00	$66.10
3	65	$33.98	$13.03	$21.70	$0.00	$68.71
4	75	$39.21	$13.03	$21.70	$0.00	$73.94
5	85	$44.44	$13.03	$21.70	$0.00	$79.17

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
(Hot Pitch Mechanics' receive $1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	08/01/2024	$51.28	$13.03	$21.70	$0.00	$86.01
	02/01/2025	$52.53	$13.03	$21.70	$0.00	$87.26
	08/01/2025	$54.03	$13.03	$21.70	$0.00	$88.76
	02/01/2026	$55.28	$13.03	$21.70	$0.00	$90.01

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - B*	10/01/2024	$42.33	$14.59	$19.04	$2.24	$78.20
	04/01/2025	$43.83	$14.59	$19.04	$2.24	$79.70
	10/01/2025	$45.08	$14.59	$19.04	$2.24	$80.95
	04/01/2026	$46.58	$14.59	$19.04	$2.24	$82.45

Apprentice - *SHEET METAL WORKER - Local 17-B*

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$16.93	$14.59	$4.18	$1.09	$36.79
2	45	$19.05	$14.59	$4.71	$1.17	$39.52
3	50	$21.17	$14.59	$11.84	$1.45	$49.05
4	55	$23.28	$14.59	$11.84	$1.52	$51.23
5	60	$25.40	$14.59	$15.53	$1.64	$57.16
6	65	$27.51	$14.59	$15.84	$1.71	$59.65
7	70	$29.63	$14.59	$16.15	$1.78	$62.15
8	75	$31.75	$14.59	$16.45	$1.86	$64.65
9	80	$33.86	$14.59	$16.76	$1.93	$67.14
10	85	$35.98	$14.59	$17.07	$2.00	$69.64

Effective Date - 04/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.53	$14.59	$4.18	$1.09	$37.39
2	45	$19.72	$14.59	$4.71	$1.17	$40.19
3	50	$21.92	$14.59	$11.84	$1.45	$49.80
4	55	$24.11	$14.59	$11.84	$1.52	$52.06
5	60	$26.30	$14.59	$15.53	$1.64	$58.06
6	65	$28.49	$14.59	$15.84	$1.71	$60.63
7	70	$30.68	$14.59	$16.15	$1.78	$63.20
8	75	$32.87	$14.59	$16.45	$1.86	$65.77
9	80	$35.06	$14.59	$16.76	$1.93	$68.34
10	85	$37.26	$14.59	$17.07	$2.00	$70.92

Notes:

Apprentice to Journeyworker Ratio:1:3

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.24	$15.57	$20.17	$0.00	$75.98
	06/01/2025	$41.24	$15.57	$20.17	$0.00	$76.98
	12/01/2025	$41.24	$15.57	$21.78	$0.00	$78.59
	01/01/2026	$41.24	$16.17	$21.78	$0.00	$79.19
	06/01/2026	$42.24	$16.17	$21.78	$0.00	$80.19
	12/01/2026	$42.24	$16.17	$23.52	$0.00	$81.93
	01/01/2027	$42.24	$16.77	$23.52	$0.00	$82.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.53	$15.57	$20.17	$0.00	$76.27
	06/01/2025	$41.53	$15.57	$20.17	$0.00	$77.27
	12/01/2025	$41.53	$15.57	$21.78	$0.00	$78.88
	01/01/2026	$41.53	$16.17	$21.78	$0.00	$79.48
	06/01/2026	$42.53	$16.17	$21.78	$0.00	$80.48
	12/01/2026	$42.53	$16.17	$23.52	$0.00	$82.22
	01/01/2027	$42.53	$16.77	$23.52	$0.00	$82.82
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2*	10/01/2024	$63.31	$11.51	$23.80	$0.00	$98.62
	03/01/2025	$64.93	$11.51	$23.80	$0.00	$100.24

Apprentice - *SPRINKLER FITTER - Local 550 (Section B) Zone 2*

Effective Date - 10/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$22.16	$11.51	$13.07	$0.00	$46.74
2	40	$25.32	$11.51	$13.90	$0.00	$50.73
3	45	$28.49	$11.51	$14.72	$0.00	$54.72
4	50	$31.66	$11.51	$15.55	$0.00	$58.72
5	55	$34.82	$11.51	$16.38	$0.00	$62.71
6	60	$37.99	$11.51	$17.20	$0.00	$66.70
7	65	$41.15	$11.51	$18.03	$0.00	$70.69
8	70	$44.32	$11.51	$18.85	$0.00	$74.68
9	75	$47.48	$11.51	$19.68	$0.00	$78.67
10	80	$50.65	$11.51	$20.50	$0.00	$82.66

Effective Date - 03/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$22.73	$11.51	$13.07	$0.00	$47.31
2	40	$25.97	$11.51	$13.90	$0.00	$51.38
3	45	$29.22	$11.51	$14.72	$0.00	$55.45
4	50	$32.47	$11.51	$15.55	$0.00	$59.53
5	55	$35.71	$11.51	$16.38	$0.00	$63.60
6	60	$38.96	$11.51	$17.20	$0.00	$67.67
7	65	$42.20	$11.51	$18.03	$0.00	$71.74
8	70	$45.45	$11.51	$18.85	$0.00	$75.81
9	75	$48.70	$11.51	$19.68	$0.00	$79.89
10	80	$51.94	$11.51	$20.50	$0.00	$83.95

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
STEAM BOILER OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 223*	09/01/2024	$40.69	$11.75	$14.53	$0.00	$66.97
	09/01/2025	$42.52	$12.00	$15.30	$0.00	$69.82
	09/01/2026	$44.41	$12.25	$16.09	$0.00	$72.75
	09/01/2027	$46.51	$12.50	$16.93	$0.00	$75.94

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 223*

Effective Date - 09/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$0.00	$0.00	$0.00	$0.00

Notes: See Electrician Apprentice Wages

Telecom Apprentice Wages shall be the same as the Electrician Apprentice Wages

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2024	$63.44	$11.49	$23.59	$0.00	$98.52
	02/01/2025	$64.74	$11.49	$23.59	$0.00	$99.82
	08/01/2025	$66.89	$11.49	$23.59	$0.00	$101.97
	02/01/2026	$68.24	$11.49	$23.59	$0.00	$103.32
	08/01/2026	$70.44	$11.49	$23.59	$0.00	$105.52
	02/01/2027	$71.84	$11.49	$23.59	$0.00	$106.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TERRAZZO FINISHER - Local 3 Marble & Tile*

Effective Date - 08/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.72	$11.49	$23.59	$0.00	$66.80
2	60	$38.06	$11.49	$23.59	$0.00	$73.14
3	70	$44.41	$11.49	$23.59	$0.00	$79.49
4	80	$50.75	$11.49	$23.59	$0.00	$85.83
5	90	$57.10	$11.49	$23.59	$0.00	$92.18

Effective Date - 02/01/2025

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.37	$11.49	$23.59	$0.00	$67.45
2	60	$38.84	$11.49	$23.59	$0.00	$73.92
3	70	$45.32	$11.49	$23.59	$0.00	$80.40
4	80	$51.79	$11.49	$23.59	$0.00	$86.87
5	90	$58.27	$11.49	$23.59	$0.00	$93.35

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$51.28	$9.65	$18.22	$0.00	$79.15
	06/01/2025	$52.78	$9.65	$18.22	$0.00	$80.65
	12/01/2025	$54.28	$9.65	$18.22	$0.00	$82.15
	06/01/2026	$55.83	$9.65	$18.22	$0.00	$83.70
	12/01/2026	$57.33	$9.65	$18.22	$0.00	$85.20
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$47.07	$9.65	$18.22	$0.00	$74.94
	06/01/2025	$48.57	$9.65	$18.22	$0.00	$76.44
	12/01/2025	$50.07	$9.65	$18.22	$0.00	$77.94
	06/01/2026	$51.62	$9.65	$18.22	$0.00	$79.49
	12/01/2026	$53.12	$9.65	$18.22	$0.00	$80.99
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2024	$46.95	$9.65	$18.22	$0.00	$74.82
	06/01/2025	$48.45	$9.65	$18.22	$0.00	$76.32
	12/01/2025	$49.95	$9.65	$18.22	$0.00	$77.82
	06/01/2026	$51.50	$9.65	$18.22	$0.00	$79.37
	12/01/2026	$53.00	$9.65	$18.22	$0.00	$80.87
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	12/01/2024	$56.40	$15.55	$16.50	$0.00	$88.45
	06/01/2025	$57.68	$15.55	$16.50	$0.00	$89.73
	12/01/2025	$59.12	$15.55	$16.50	$0.00	$91.17
	06/01/2026	$60.40	$15.55	$16.50	$0.00	$92.45
	12/01/2026	$61.84	$15.55	$16.50	$0.00	$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.82	$15.57	$20.17	$0.00	$76.56
	06/01/2025	$41.82	$15.57	$20.17	$0.00	$77.56
	12/01/2025	$41.82	$15.57	$21.78	$0.00	$79.17
	01/01/2026	$41.82	$16.17	$21.78	$0.00	$79.77
	06/01/2026	$42.82	$16.17	$21.78	$0.00	$80.77
	12/01/2026	$42.82	$16.17	$23.52	$0.00	$82.51
	01/01/2027	$42.82	$16.77	$23.52	$0.00	$83.11
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	12/01/2024	$59.18	$9.65	$19.00	$0.00	$87.83
	06/01/2025	$60.68	$9.65	$19.00	$0.00	$89.33
	12/01/2025	$62.18	$9.65	$19.00	$0.00	$90.83
	06/01/2026	$63.73	$9.65	$19.00	$0.00	$92.38
	12/01/2026	$65.23	$9.65	$19.00	$0.00	$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	12/01/2024	$61.18	$9.65	$19.00	$0.00	$89.83
	06/01/2025	$62.68	$9.65	$19.00	$0.00	$91.33
	12/01/2025	$64.18	$9.65	$19.00	$0.00	$92.83
	06/01/2026	$65.73	$9.65	$19.00	$0.00	$94.38
	12/01/2026	$67.23	$9.65	$19.00	$0.00	$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	12/01/2024	$51.25	$9.65	$19.00	$0.00	$79.90
	06/01/2025	$52.75	$9.65	$19.00	$0.00	$81.40
	12/01/2025	$54.25	$9.65	$19.00	$0.00	$82.90
	06/01/2026	$55.80	$9.65	$19.00	$0.00	$84.45
	12/01/2026	$57.30	$9.65	$19.00	$0.00	$85.95
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	12/01/2024	$53.25	$9.65	$19.00	$0.00	$81.90
	06/01/2025	$54.75	$9.65	$19.00	$0.00	$83.40
	12/01/2025	$56.25	$9.65	$19.00	$0.00	$84.90
	06/01/2026	$57.80	$9.65	$19.00	$0.00	$86.45
	12/01/2026	$59.30	$9.65	$19.00	$0.00	$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	01/01/2025	$40.24	$15.57	$20.17	$0.00	$75.98
	06/01/2025	$41.24	$15.57	$20.17	$0.00	$76.98
	12/01/2025	$41.24	$15.57	$21.78	$0.00	$78.59
	01/01/2026	$41.24	$16.17	$21.78	$0.00	$79.19
	06/01/2026	$42.24	$16.17	$21.78	$0.00	$80.19
	12/01/2026	$42.24	$16.17	$23.52	$0.00	$81.93
	01/01/2027	$42.24	$16.77	$23.52	$0.00	$82.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WAGON DRILL OPERATOR	12/01/2024	$40.61	$9.65	$17.70	$0.00	$67.96
LABORERS - ZONE 2	06/01/2025	$42.00	$9.65	$17.70	$0.00	$69.35
	12/01/2025	$43.38	$9.65	$17.70	$0.00	$70.73
	06/01/2026	$44.82	$9.65	$17.70	$0.00	$72.17
	12/01/2026	$46.26	$9.65	$17.70	$0.00	$73.61
	06/01/2027	$47.71	$9.65	$17.70	$0.00	$75.06
	12/01/2027	$49.16	$9.65	$17.70	$0.00	$76.51
	06/01/2028	$50.66	$9.65	$17.70	$0.00	$78.01
	12/01/2028	$52.16	$9.65	$17.70	$0.00	$79.51
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	12/01/2024	$40.11	$9.65	$17.80	$0.00	$67.56
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2025	$41.50	$9.65	$17.80	$0.00	$68.95
	12/01/2025	$42.88	$9.65	$17.80	$0.00	$70.33
	06/01/2026	$44.32	$9.65	$17.80	$0.00	$71.77
	12/01/2026	$45.76	$9.65	$17.80	$0.00	$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR	12/01/2024	$57.03	$15.55	$16.50	$0.00	$89.08
OPERATING ENGINEERS LOCAL 4	06/01/2025	$58.33	$15.55	$16.50	$0.00	$90.38
	12/01/2025	$59.78	$15.55	$16.50	$0.00	$91.83
	06/01/2026	$61.08	$15.55	$16.50	$0.00	$93.13
	12/01/2026	$62.53	$15.55	$16.50	$0.00	$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER	08/26/2024	$54.74	$10.15	$19.95	$0.00	$84.84
PLUMBERS & PIPEFITTERS LOCAL 51	08/25/2025	$57.49	$10.15	$19.95	$0.00	$87.59
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Additional Apprentice Information:

All apprentices must be registered with the Division of Apprenticeship Training (DAS) in accordance with M.G.L. c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L. c. 149, §§ 26-27D. Apprentice ratios are established by DAS pursuant to M.G.L. c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements (CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate. Parties having questions regarding what ratio to use should contact DAS.

ATTACHMENT A

PREVAILING WAGE SCHEDULE

The minimum wage rates provided in the following pages have been provided by the Division of Occupational Safety of the Massachusetts Department of Labor and Workforce Development. The Awarding Authority is not responsible for errors or omissions in such wage rates.

M.G.L. c. 149, §§ 26 and 27 provide as follows:

". . . Payments by employers to health and welfare plans, pension plans and supplementary unemployment benefit plans under collective bargaining agreements or understandings between organized labor and employers shall be included for the purpose of establishing minimum wage rates as herein provided.

. . . The aforesaid rates of wages in the schedule of wage rates shall include payments by employers to health and welfare plans, pension plans and supplementary unemployment benefit plans as provided in said section twenty-six, and such payments shall be considered as payments to persons under this section performing work as herein provided. Any employer engaged in the construction of such works who does not make payments to a health and welfare plan, a pension plan and a supplementary unemployment benefit plan, where such payments are included in said rates of wages, shall pay the amount of said payments directly to each employee engaged in said construction"

Wage Request Number: 20250108-040

The undersigned hereby certifies that it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that it will comply fully with all laws and regulations applicable to awards made subject to section 39M of Chapter 30 of the General Laws.

Bidder acknowledges receipt of the most recent prevailing wage rates and has incorporated said rates into their proposed bid(s).

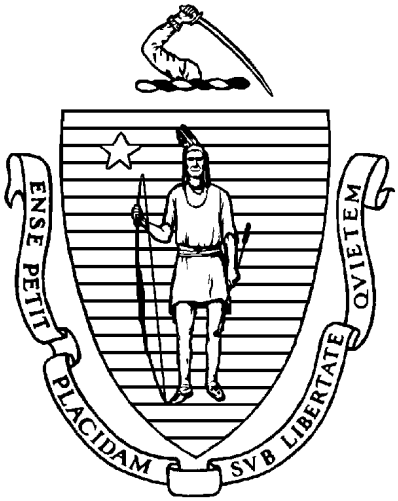
Signature:_____

Name and Title:_____

ATTACHMENT B:
Form and Checklists Used For General Bids

1) Form for General Bid
2) General Bidder Check list
3) General Bidder Documents to Upload into COMMBUYS Checklist

Executive Office for Health and Human Services
Department of Mental Health
Office of Engineering and Facilities Management
Hadley Building
167 Lyman Street
Westborough, MA 01581
Telephone: (617) 571-5254



COMMONWEALTH OF MASSACHUSETTS
FORM FOR GENERAL BID

2024-067A Emergency Generator Replacement
Corrigan Mental Health Center
49 Hillside Street
Fall River, Massachusetts 02720

The following **must** be uploaded into **COMMBUYS** as part of this bid:

1. A photo copy of the Bid deposit meeting the requirements of Section 5.13 and 5.14 of the Instructions to Bidders uploaded into COMMBUYS.

2. Complete Statement of Prior Relevant Experience, Facilities, Equipment, References and any other information called for as further set forth in Project Specifications.

FORM FOR GENERAL BID

To the Awarding Authority: **DEPARTMENT OF MENTAL HEALTH (DMH)**

A. The undersigned proposes to furnish all labor and materials required for

Project Name: **2024-067A Emergency Generator Replacement at Corrigan Mental Health Center 49 Hillside Street, Fall River, Massachusetts 02720**, in accordance with the accompanying plans and specifications prepared by DMH Engineering for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. This bid includes addenda numbered: (please indicate by checking the box of each addenda number)

☐ No. 1 ☐ No. 2 ☐ No. 3 ☐ No. 4 ☐ No. 5 ☐ No. 6

C. The proposed contract price is:

_____

_____
(total bid in words)

dollars ($_____).

For Alternate No. 1: Add $_____ Subtract $_____

For Alternate No. 2: Add $_____ Subtract $_____

For Alternate No. 3: Add $_____ Subtract $_____

Name of General Bidder: _____

D. The undersigned agrees that, if it is selected as general contractor, it will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a 100% performance bond and a 100% payment bond, each of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price.

The undersigned hereby certifies that it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that it will comply fully with all laws and regulations applicable to awards made subject to section 39M of Chapter 30 of the General Laws.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

The undersigned further certifies under penalties of perjury that the undersigned is not debarred from doing public construction work under any law, rule or regulation of the federal government.

The undersigned hereby declares that the undersigned has carefully examined the Advertisement, Instructions to Bidders, Owner - Contractor Agreement, General Conditions of the Contract, Special Conditions (if any), Plans and Specifications, all other Contract Documents, and also the Site upon which the proposed work is to be performed. The undersigned further declares that in regard to the conditions affecting the work to be done and the labor and materials needed, this proposal is based solely on the undersigned's own investigation and research and not in reliance upon any representation of any employee, officer or agent of the Commonwealth.

The undersigned further certifies under the penalties of perjury that:

1. This bid is in all respects bona fide, fair and made without collusion or fraud with any other person;
2. We are the only persons interested in this proposal;
3. That it is made without any connection with any other person making any bid for the same work and without directly or indirectly influencing or attempting to influence any other person to bid to refrain from bidding or to influence the amount of the bid of any other person or corporation;
4. That no person acting for, or employed by, the Commonwealth of Massachusetts is directly or indirectly interested in this proposal, or in any contract which be made under it, or in expected profits to arise therefrom.
5. As used above the word "person" shall mean natural person, joint venture, partnership, corporation or other business or legal entity.

The undersigned certifies that it shall comply with the provisions of the Equal Employment Opportunity, Non-Discrimination, and Affirmative Action Program set forth in the General Conditions of the Contract.

Should the Contract Documents require submission of special data to accompany the bid, the Awarding Authority reserves the right to rule the bidder's failure to submit such data an informality and to receive said data subsequently within a reasonable time as set by the Awarding Authority.

Date_____, **2025**.

_____
(Name of General Bidder)

By_____
(Typed/Printed Name of Person & Title Signing Bid)

By_____
(Signed Name of Person & Title Signing Bid)

_____
(Business Address, City, State)

_____
(Telephone Number)

_____
(Facsimile Number and email address)

The following information is furnished by the Bidder for the information of the Department of Mental Health.

Bidders Vendor Code / FEIN #_____
Is Bidder a corporation? ____ If so, incorporated in what state?_____
President_____
Secretary or Clerk _____
Treasurer_____
If Bidder is a foreign corporation, is it registered to do business in Massachusetts?_____
If Bidder is a foreign corporation and is selected, Bidder is required under M.G.L. c. 30, s. 39L to obtain from the Massachusetts Secretary of State, One Ashburton Place, 17th floor, a certificate stating that the corporation is registered to do business in Massachusetts, and to furnish said certificate to the awarding authority prior to the award.

Is Bidder a general partnership or joint venture? _____ If so, name each partner or venturer_____
Is Bidder a limited partnership? _____
Is Bidder registered in Massachusetts? ____ If so, name each general partner _____
_____
If Bidder is a foreign limited partnership and is selected, Bidder is required under M.G.L. c. 30, s. 39L to obtain from the Massachusetts Secretary of State, One Ashburton Place, 17th floor, a certificate stating that the partnership is registered to do business in Massachusetts, and to furnish said certificate to the awarding authority prior to the award.

For each general partner or venturer that is a corporation, provide the following information (use additional sheets if necessary):
Name of corporation _____
State of incorporation_____
President_____
Secretary or Clerk _____
Treasurer_____

Name of corporation _____
State of incorporation_____
President_____
Secretary or Clerk _____
Treasurer_____

Is Bidder an individual? _____
Residence Address_____
Name under which Bidder does business_____
_____
Business Address_____

If selected Bidder is an individual doing business under a different name then Bidder must furnish evidence of any required DBA filing.

GENERAL BIDDER CHECKLIST

This is not a contract document. It is provided to help bidders avoid common mistakes that can result in the rejection of bids. It does not modify the Contract Documents.

*****Please note that all BID documents must be uploaded into COMMBUYS*****

To ensure that your bids are acceptable to the Department, and are not rejected due to errors or omissions, we are providing this Checklist for your convenience. It does not modify the Contract Documents.

☐ 1. Have you used the correct bid form provided in Attachment B ~~(and Attachment C if applicable)~~ to the Instructions to Bidders?

☐ 2. Have you properly identified the project, architect, etc., on your bid form?

☐ 3. Have you acknowledged receipt of the most current prevailing Wage Rates and/or Truck Rates which have been provided by the Awarding Authority? (Done by completing the bottom of Attachment A in this Part 1 packet.)

☐ 4. Are your bid amounts, as expressed in figures and words, consistent?
The amount expressed in words will control.

☐ 5. Have you acknowledged all addenda issued by placing the number of each addenda on the Bid Form and followed the instructions contained in each one?

☐ 6. If you are a General Bidder, have you responded to every alternate? ~~If you are a sub-bidder, have you responded to all of those alternates identified as applying to the filed sub-bid section you are bidding on?~~

☐ 7. If you are a general bidder ~~or a sub-bidder~~ affected by an alternate and an alternate price is requested and you estimate that there is no change in price, did you indicate by writing "no change", "N/C", or "0" ? Failure to provide a price, no change, N/C or 0 for an alternate by general bidders and sub-bidders when identified as part of a sub-bidders scope of work will result in rejection of your bid.

☐ 8. ~~If you are a sub-bidder and the alternate does not affect your category of work, have you left the alternate blank or written "N/A" and only "N/A" ?~~

☐ 9. ~~If you are a sub-bidder and the bid documents request that you supply the name of the firm(s) that will do certain work identified as sub-subcontract paragraph E work, have you completed the Paragraph E section.~~

☐ 10. Have you added any information not called for, acknowledged an addendum that does not exist, or provided a price for an alternate not identified as part of your scope of work which can result in rejection of your bid?

☐ 11. Is your Bid Form **SIGNED and** dated?

12. **BID DEPOSITS**

☐ a. **Have you uploaded your Bid Deposit onto COMMBUYS and FEDExed your original bid bond to arrive prior to the bid opening date?**

☐ b. Is your bid deposit, if in the form of a bid bond, issued from a bonding company licensed to do business in the Commonwealth of Massachusetts? **Is it signed by the contractor and the bonding company?**

☐ c. Is your bid deposit made payable to the Commonwealth of Massachusetts**? Bid deposits made payable to any other entity may cause the bid to be rejected.**

☐ d**.** Is your bid deposit five (5%) of the highest possible bid amount, considering all alternates being accepted in order?

☐ 13**.** If you are a General Contractor, have you included your current DCAMM Certificate of Eligibility and a completed, signed DCAMM Update Statement.

☐ 14**.** ~~If you are a Sub-Contractor, have you included your current Certificate of Eligibility and a completed, signed DCAMM Update Statement?~~

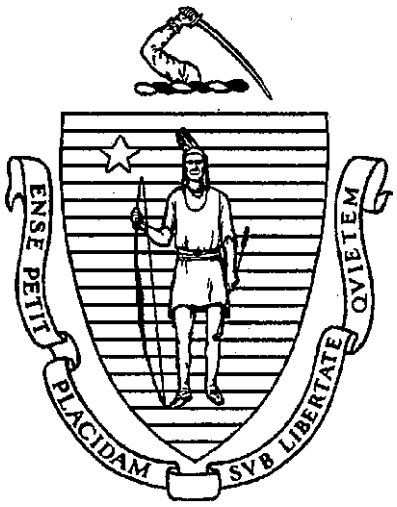
☐ 15**.** Are all of your bid materials **uploaded into COMMBUYS** exactly as provided in the Instructions to Bidders?

☐ 16**.** Your bid MUST be **uploaded into COMMBUYS** prior to the deadline!

Rev. December 3, 2020

GENERAL BIDDER DOCUMENTS TO UPLOAD TO COMMBUYS CHECKLIST

- ☐ **1. GENERAL BID FORM (PART 1 Attachment B)**
- ☐ **2. WAGE RATES ACKNOWLEDGEMENT (PART 1 ATTACHMENT A)**
  (Complete the bottom of Attachment A in this Part 1 packet.)
- ☐ **3. 5% BID BOND**
- ☐ **4. GENERAL CONTRACTOR - DCAMM UPDATE STATEMENT**
- ☐ **5. GENERAL CONTRACTOR - DCAMM CERTIFICATE OF ELIGIBILITY**
- ☐ 6. ~~GENERAL CONTRACTOR – CHPT. 30 MassDOT PREQUALIFICATION STATEMENT (NOT APPLICABLE)~~



BID PACKAGE

PART II

Forms for Contract Execution

- Executive Order 481
- Executive Order 504 (2 pages)
- Owner- Contractor Agreement
- 100 % Payment Bond
- 100 % Performance Bond
- Prompt Payment Discount
- Certificate of Corporate Vote
- Certificate of Compliance with State Tax Laws and With Unemployment Compensation Contribution Requirements
- Certificate of Compliance with Employment Eligibility Verification Requirements (I-9)
- Request for Taxpayer Identification Number and Certification (W-9) (2 pages)
- Authorized Signatory Listing Form (choose 1 below and complete)
    - Notarized Signature for Individual, Sole-Proprietor or Single Member LLC
    - Signature for Corporation (C or S), Partnership, Trust/Estate, Limited Liability Company
- Electronic Funds Transfer Sign Up Form
- Insurance Document Required - Proof of Insurance amounts per Part 3 General Conditions of the Contract

Forms are for Reference Only
To be used for contract award and execution

Issued March 2007

COMMONWEALTH OF MASSACHUSETTS

EXECUTIVE ORDER 481 - CONTRACTOR CERTIFICATION

PROHIBITING THE USE OF UNDOCUMENTED WORKERS ON STATE CONTRACTS

CONTRACTOR LEGAL NAME:
CONTRACTOR VENDOR/CUSTOMER CODE:

INSTRUCTIONS:

Executive Order 481 applies to all state agencies in the Executive Branch, including all executive offices, boards, commissions, agencies, departments, divisions, councils, bureaus, and offices, now existing and hereafter established. As it is the policy of the Executive Branch to prohibit the use of undocumented workers in connection with the performance of state contracts, all contracts entered into after February 23, 2007 require that contractors, as a condition of receiving Commonwealth funds under any Executive Branch contract, make the following certification:

CONTRACTOR CERTIFICATION:

As evidenced by the signature of the Contractor's Authorized Signatory below, the Contractor certifies under the pains and penalties of perjury that the Contractor shall not knowingly use undocumented workers in connection with the performance of all Executive Branch contracts; that pursuant to federal requirements, the Contractor shall verify the immigration status of all workers assigned to such contracts without engaging in unlawful discrimination; and that the Contractor shall not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker(s). The Contractor understands and agrees that breach of any of these terms during the period of each contract may be regarded as a material breach, subjecting the Contractor to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or termination.

_____ Date: _____
Contractor Authorizing Signature

_____
Print Name

Title:_____ Telephone: _____

Fax: _____ Email: _____

The Contractor is required to sign this Certification only once and may provide a copy of the signed Certification for any contract executed with an Executive Branch Department. A copy of this signed Certification must be attached to the "record copy" of all contracts with this Contractor that are filed with the contracting Department.

Executive Order 504 Contractor Certification Form

BIDDER/CONTRACTOR LEGAL NAME:

BIDDER/CONTRACTOR VENDOR/CUSTOMER CODE:

Executive Order 504: For all Contracts involving the Contractor's access to personal information, as defined in M.G.L. c. 93H, and personal data, as defined in M.G.L. c. 66A, owned or controlled by Executive Department agencies, or access to agency systems containing such information or data (herein collectively "personal information"), Contractor certifies under the pains and penalties of perjury that the Contractor (1) has read Commonwealth of Massachusetts Executive Order 504 and agrees to protect any and all personal information; and (2) has reviewed all of the Commonwealth of Massachusetts Information Technology Division's Security Policies available at www.mass.gov/ITD under Policies and Standards.

Notwithstanding any contractual provision to the contrary, in connection with the Contractor's performance under this Contract, for all state agencies in the Executive Department, including all executive offices, boards, commissions, agencies, departments, divisions, councils, bureaus, and offices, now existing and hereafter established, the Contractor shall:

(1)obtain a copy, review, and comply with the contracting agency's Information Security Program (ISP) and any pertinent security guidelines, standards and policies; (2) comply with all of the Commonwealth of Massachusetts Information Technology Division's Security Policies ("Security Policies") available at www.mass.gov/ITD under Policies and Standards;

(2) communicate and enforce the contracting agency's ISP and such Security Policies against all employees (whether such employees are direct or contracted) and subcontractors;

(3) implement and maintain any other reasonable appropriate security procedures and practices necessary to protect personal information to which the Contractor is given access by the contracting agency from the unauthorized access, destruction, use, modification, disclosure or loss;

(4) be responsible for the full or partial breach of any of these terms by its employees (whether such employees are direct or contracted) or subcontractors during or after the term of this Contract, and any breach of these terms may be regarded as a material breach of this Contract;

(5) in the event of any unauthorized access, destruction, use, modification, disclosure or loss of the personal information (collectively referred to as the "unauthorized use"): (a) immediately notify the contracting agency if the Contractor becomes aware of the unauthorized use; (b) provide full cooperation and access to information necessary for the contracting agency to determine the scope of the unauthorized use; and (c)

provide full cooperation and access to information necessary for the contracting agency and the Contractor to fulfill any notification requirements.

Breach of these terms may be regarded as a material breach of this Contract, such that the Commonwealth may exercise any and all contractual rights and remedies, including without limitation indemnification under Section 11 of the Commonwealth's Terms and Conditions, withholding of payments, contract suspension, or termination. In addition, the Contractor may be subject to applicable statutory or regulatory penalties, including and without limitation, those imposed pursuant to M.G.L. c. 93H and under M.G.L. c. 214, § 3B for violations under M.G.L. c. 66A.

Bidder/Contractor Name: _____.

Bidder/Contractor Authorized Signature: _____.

Print Name and Title of Authorized Signatory: _____.

Date: _____.

This Certification may be signed once and photocopied to be attached to any Commonwealth Contract that does not already contain this Certification Language and shall be interpreted to be incorporated by reference into any applicable contract subject to Executive Order 504 for this Contractor.

COMMONWEALTH OF MASSACHUSETTS
STANDARD VERTICAL CONSTRUCTION CONTRACT
For Projects Over $150,000 Subject to M.G.L. c. 149, §§ 44A -F

OWNER - CONTRACTOR AGREEMENT

Awarding Authority: **DEPARTMENT OF MENTAL HEALTH (DMH)**
Awarding Authority Address: **167 Lyman Street, Westborough, MA 01581**
Department Code: **DMH**

This Owner-Contractor agreement ("Contract") is made as of the _____ day of _____, **2025**, by and between the Commonwealth of Massachusetts acting by and through the awarding authority identified above ("Awarding Authority") and _____, a Contractor with a principal place of business at _____, hereinafter called the "Contractor."

Terms used in this Contract which are defined in the General Conditions of the Contract ("General Conditions") attached hereto shall have the meanings designated therein.

The Awarding Authority and the Contractor agree as follows:

Article 1. Scope of Work. The Work under this Contract is defined as all work required by the Contract Documents for the **Emergency Generator Replacement at Corrigan Mental Health Center located at 49 Hillside Street, Massachusetts 02720, DMH Project No. 2024-067A** and Contract No. _____, in accordance with and as described in the **Drawings dated January 15, 2025 and Specifications dated January 15, 2025, prepared by DMH Engineering ("Designer")**, as modified by Addenda Nos. _____dated _____.

Article 2. Time for Completion. The Contractor shall commence the Work under this Contract on the date specified in the written Notice to Proceed and shall, within **fourteen (14) calendar months** after such date, bring the Work to Substantial Completion and to the point at which a Certificate of Substantial Completion may be issued. The Contractor shall bring the Work to Final Acceptance within 45 days after the date specified for Substantial Completion. Liquidated damages for this Project shall be assess as set forth Article VI of the General Conditions of the Contract. The agreed liquidated damages amounts shall be **$500.00 per day** for each calendar day of delay in achieving Substantial Completion.

Article 3. Contract Price. The Awarding Authority shall pay the Contractor, in current funds, for the proper performance of the Contract and completion of the Work, subject to additions and deductions by Approved Change Order(s), the Contract Price of _____ dollars ($_____). The unit prices, if any, approved by the Awarding Authority are those included in the Contractor's General Bid. The following alternates have been accepted and their costs are included in the Contract Price:

Alternate No(s): N/A

Article 4. Approved Subcontractors. The filed Subcontractors listed in the General Bid submitted by the Contractor have been approved for the performance of the specified portions of the Work subject to the Commonwealth's verification that they have complied with state corporation and partnership registration laws. No other filed Subcontractors and no non-filed Subcontractors shall be used for these or any other portions of the Work without the prior written Approval of the Awarding Authority.

Article 5. Certifications. Pursuant to M.G.L. c. 62(c), § 49(a), the individual signing this Contract on behalf of the Contractor hereby certifies under the penalties of perjury that to the best of his or her knowledge and belief the Contractor has complied with any and all applicable state and federal tax laws. The individual signing this Contract on behalf of the Contractor further certifies under penalties of perjury that the Contractor is not presently debarred from doing public construction work in the Commonwealth under the provisions of M.G.L. c. 29, § 29F, or any other applicable debarment provisions of any other chapter of the Massachusetts General Laws or any rule or regulation promulgated thereunder and is not presently debarred from doing public construction work by any agency of the United States.

Article 6. The Contract Documents. The following documents form the Contract, are incorporated by reference herein, and are referred to as the "Contract Documents:"

- The instructions to bidders included in the bid documents issued by the Awarding Authority for this Project;
- The General Bid submitted by the Contractor;
- This Contract;
- The General Conditions of the Contract;
- The Drawings and Specifications prepared by the Designer, including addenda thereto identified in Article 1 above; and
- All Approved Change Orders/Contract Modifications issued after execution of this Contract

Article 7. Minority Business Enterprise and Women Business Enterprise Participation Goals and Minority/Women Workforce Utilization Percentages. The applicable goals, if any, for minority business enterprise and woman business enterprise participation established for this Contract are as follows:

The separate Minority Business Enterprise and Women Business Enterprise (MBE & WBE) participation goals for this Contract are 0 % MBE and 0 % WBE of the Contract Price.

The applicable minority workforce utilization percentage is 0%.

The applicable women workforce utilization percentage is 0%.

Article 7A. Veteran-Owned Business Enterprises Benchmark and Other Participation. The Commonwealth encourages and monitors the participation of service-disabled veteran-owned business enterprises (SDVOBE) and veteran business enterprises (VBE) on its construction projects. The benchmark for SDVOBE and VBE participation on the project is 3%. The Commonwealth also encourages the participation of Portuguese Business Enterprises (PBE), Lesbian, Gay, Bisexual, and Transgender Business Enterprises (LGBTBE); and Disability-Owned Business Enterprises (DOBE) on its contracts. Please note that only firms SDO certified as MBE or WBEs can be credited toward meeting project MBE or WBE goals.

Article 8. Additional Insurance Provisions. The insurance requirements set forth in Article XIV of the General Conditions of the Contract are supplemented by the provisions, if any, appearing in Exhibit A attached hereto and incorporated herein.

In witness whereof, the parties hereto have caused this instrument to be executed under seal as of the date set forth above.

CONTRACTOR:

Name (Signed):_____

Name (Printed): _____

Title: _____

Date: _____

AWARDING AUTHORITY: DEPARTMENT OF MENTAL HEALTH (DMH)

By executing this Agreement, the undersigned authorized signatory of the Awarding Authority, who incurs no personal liability by reason of the execution hereof or anything herein contained, hereby certifies under penalties of perjury that this Contract is executed in accordance with a prior approval of the Division of Capital Asset Management and Maintenance, and further certifies under the penalties of perjury that all the applicable provisions of M.G.L. c.149, § 44J, have been complied with.

Name (Signed):_____

Name (Printed): _____

Title: _____

Date: _____

EXHIBIT A to the Owner-Contractor Agreement

Additional Insurance Provisions

NONE.

EXHIBIT B to the Owner-Contractor Agreement

Forms Used During Contract Award and Execution

- Executive Orders 481 & 504 Contractor Certifications
- 100% Payment Bond
- 100% Performance Bond
- Award Letter
- Prompt Payment Discount
- Certificate of Compliance with State Tax Laws and With Unemployment Compensation Contribution Requirements
- Certificate of Compliance with Employment Eligibility Verification Requirements (I-9)
- Request for Taxpayer Identification Number and Certification (W-9) (2 pages)
- Authorized Signatory Listing Form (choose 1 below and complete from Part 2 Forms for Contract Execution)
  - Notarized Signature for Individual, Sole-Proprietor or Single Member LLC
  - Signature for Corporation (C or S), Partnership, Trust/Estate, Limited Liability Company
- Electronic Funds Transfer Sign Up Form
- Notice To Proceed (Letter to Proceed)
- Any other document/form not listed here that DMH needs the Contractor to complete

PAYMENT BOND

Know all men by these presents, that

_____

as principal, and _____
as surety, are held and firmly bound unto the Commonwealth of Massachusetts in the sum of

_____
in lawful money of the United States of America, to be paid to the Commonwealth of Massachusetts, for which payments, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said principal has made a Contract with the Commonwealth acting through its _____ ("Awarding Authority") bearing date of _____, 20____, for the construction of Project No. _____ Contract No. _____
Project Name _____
_____

Now the condition of this obligation is such that if the principal shall pay for all labor performed or furnished and for all materials used or employed in said Contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said Contract that may hereafter be made, notice to the surety of such modifications, alterations, extensions of time, changes or additions being hereby waived, the foregoing to include any other purpose or items set out in, and to be subject to, provisions of Massachusetts General Laws Chapter 30, section 39A, and Chapter 149, section 29, as amended, then this obligation shall become null and void; otherwise it shall remain in full force and virtue.

In witness whereof we hereunto set our hand and seals this _____ day of _____, 20__.

_____ (Seal)
(Print Name of General Contractor)

By _____
(Signature - Title)

_____(Seal)
(Print Name of Surety)

_____
(Signature - Title)

Surety Address _____
_____

PERFORMANCE BOND

Know all men by these presents, that

_____

as principal, and _____
as surety, are held and firmly bound unto the Commonwealth of Massachusetts in the sum of

_____
in lawful money of the United States of America, to be paid to the Commonwealth of Massachusetts, for which payments, well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said principal has made a Contract with the Commonwealth, acting through its _____("Awarding Authority"), bearing date of _____, 20____, for the construction of Project No. _____ Contract No. _____
Project Name_____

Now the condition of this obligation is such that if the principal shall well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of said Contract and any extensions thereof that may be granted by the Commonwealth, with or without notice to the surety, and during the life of any guarantee required under the Contract, and shall also well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of any and all duly authorized modifications, alterations, changes or additions to said Contract that may hereafter be made, notice to the surety of such modifications, alterations, changes or additions being hereby waived, then this obligation shall become null and void; otherwise it shall remain in full force and virtue.

In the event that the Contract is abandoned by the Contractor, or is terminated by the Commonwealth under the provisions of said Contract, said surety shall, if requested in writing by the Commonwealth, take such action as is necessary to complete the Contract.

In witness whereof we hereunto set our hand and seals this _____ day of _____, 20____.

_____(Seal)
(Print Name of General Contractor

BY_____
(Signature - Title)

_____(Seal)
(Print Name of Surety)

BY_____
(Signature - Title)

Surety Address_____
_____

COMMONWEALTH OF MASSACHUSETTS
Prompt Pay Discount Form
(Invoice discounts for receiving fast payments)

Revised 3/9/07

Bidder Name: _____.
Vendor Code (VCUST): _____ .
Contract/RFR Number(s): _____.

Prompt Payment Discounts (PPD). All contractors/vendors doing business with the Commonwealth must provide a Prompt Payment Discount (PPD) for receiving early payments unless the Contractor/vendor can provide compelling proof that providing a prompt pay discount would be unduly burdensome. Contractors benefit from PPD by increased, usable cash flow as a result of fast and efficient payments for commodities or services rendered. Contractors who agree to accept Electronic Funds Transfer (EFT) increase the prompt pay benefit by ensuring that funds are paid directly to their designated bank accounts, thus eliminating the delay of check clearance policies and traditional mail lead time. Payments processed through the state accounting system (MMARS) can be tracked and verified through the Comptroller's Vendor Web system using the Vendor/Customer Code assigned to you by a Commonwealth department.

The Commonwealth benefits because contractors reduce the cost of products and services through the applied discount. While Bidders/Contractors have flexibility in determining the actual % discount(s) offered to the Commonwealth, the discount(s) must be identified for 10, 15, 20 and/or 30 days for payment issuance in the column entitled "% Discount Off Proposed Price" below. The Commonwealth may use the prompt pay discounts submitted as a basis for selection and may negotiate discounts as deemed in the best interest of the Commonwealth. The requirement to offer PPD discounts may be waived by the Commonwealth on a case-by-case basis if participation in the program would be unduly burdensome, provided the specific reason for the hardship is outlined below.

All discounts offered will be taken in cases where the payment issue date is within the specified number of days listed below and in accordance with the Commonwealth's Bill Paying Policy. Payment days will be measured **from** the date goods are received and accepted / performance was completed OR the date an invoice is received by the Commonwealth, whichever is later **to** the date the payment is issued as an EFT (preferred method) or mailed by the State Treasurer. The date of payment "issue" is the date a payment is considered "paid" not the date a payment is "received" by a Contractor.

If internal Bidder/Contractor systems require an alternate method of measuring payment issue dates, the Bidder/Contractor must note the issues below or on an attached page if necessary to be considered by the PMT. In cases where the Bidder/Contractor considers that offering a Prompt Payment Discount would be a hardship, the Bidder must clearly define the issues and reasons for said hardship. *Providing volume discounts or other discounts on prices is not considered a hardship, since the PPD provides the additional benefit of early cash flow for the Contractor.*

Enter the Prompt Payment Discount percentage (%) off the invoice payment, for each of the payment issue dates listed, if the payment is issued within the specified Payment Issue days. For example:

5% - 10 Days
4% - 15 Days
3% - 20 Days
2% - 30 Days

If no discount is offered enter 0%

Prompt Payment Discount %	Payment Issue Date w/in
%	10 Days
%	15 Days
%	20 Days
%	30 Days

The Contractor is unable to provide a prompt payment discount due to the following hardship:

Contractor/Bidder Authorized Signature _____ Date: _____

Contractor/ Bidder Authorized Signatory Print Name and Title: _____

CERTIFICATE OF CORPORATE VOTE

_____ 20 ____

I hereby certify that I am the ____ clerk, _____, assistant clerk, of

_____ (the "Corporation") and that at a
(Name of Corporation)
duly authorized meeting of the Board of Directors of the Corporation held on

_____ in _____ at which a quorum was
(Date) (Location)
present and voting it was voted to authorize _____
(Name)
_____ of the Corporation to execute
(Officer Title)
and deliver on behalf of the Corporation the following contract and to act as principal to execute bonds in connection therewith, which contract and bonds were presented to and made a part of the records of said meeting:

Mass State Project No. _____

Project Title: _____

I further certify that _____ is the duly qualified and acting
(Name of Corporate Officer)

_____ of the Corporation and that said vote has not been
(Officer Title)
repealed, rescinded or amended.

_____
Name

_____
Date

(CORPORATE SEAL)

SUBSCRIBED AND SWORN TO THIS ____ DAY OF _____, 20____ BEFORE ME

_____
Notary Public

My Commission Expires: _____

CERTIFICATE OF COMPLIANCE WITH STATE TAX LAWS AND WITH UNEMPLOYMENT COMPENSATION CONTRIBUTION REQUIREMENTS

Pursuant to M.G.L., Ch. 62C, s. 49A and M.G.L., Ch. 151A, s. 19A, I,

_____ authorized signatory for

_____ whose principal place of business is at

_____ do hereby certify

under penalties of perjury that _____ has filed all state tax returns and paid all taxes as required by law and has complied with all state laws pertaining to contributions to the unemployment compensation fund and to payments in lieu of contributions.

The Business Organization Social Security Number or Federal Identification Number is

_____.

Signed under the penalties of perjury the _____ day of _____

20 ____.

Signature: _____

Name and Title: _____

CERTIFICATE OF COMPLIANCE WITH EMPLOYMENT ELIGIBILITY VERIFICATION REQUIREMENTS (I-9)
Applicable to All DCAM Construction Projects
To Be Executed by GC/CMGC/All Subcontractors

Company Name: _____

I, _____ authorized signatory for
Print Name
Company whose principal place of business is at _____
Address
do hereby certify under penalties of perjury that Company shall comply with Federal Department of Homeland Security Requirements in hiring any and all "Employees" to be employed in the Project who are required to be listed in the certified payroll reports for the Project. Such compliance shall include, but not be limited to the faithful completion of the Federal Department of Homeland Security Form I-9 process by Company for each of its Employees. Company shall require each of its subcontractors to execute and provide to Company a Certificate of Compliance with Employment Eligibility Verification Requirements with the execution of each subcontract. In addition, Company is aware that the certified payroll report form submitted by Company to DCAM contains a statement that the Form I-9 process was faithfully completed for each employee listed on that certified payroll report. Company thus acknowledges that it and all of its subcontractors will be required to certify that the Form I-9 process was faithfully completed for all Employees listed on each certified payroll report.

Project No.: Mass. State Project No. _____

Project Title: _____

The Company Social Security Number or Federal Identification Number is

_____.

Signed under the pains and penalties of perjury the _____ day of _____ 20 ___

Signature: _____

Name and Title: _____

Form **W-9**
(Massachusetts Substitute W-9 Form)
Rev. April 2009

Request for Taxpayer Identification Number and Certification

2022-005 Revised January 14, 2021

Completed form should be given to the department or the department you are currently doing busines with.

Please print or type

Name (List legal name, if joint names, list first & circle the name of the person whose TIN you enter in Part I-**See Specific Instruction** on page 2)

Business name, if different from above. (**See Specific Instruction** on page 2)

Check the appropriate box: ☐ Individual/Sole proprietor ☐ Corporation ☐ Partnership ☐ Other ▶----------

Legal Address: number, street, and apt. or suite no.	**Remittance Address**: if different from legal address number, street, and apt. or suite no.
City, state and ZIP code	**City, state and ZIP code**

Phone # ( ) Fax # ( ) Email address:

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. For individuals, this is your social security number (SSN). **However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instruction on page 2**. For other entities, it is your employer identification number (EIN). If you do not have a number, see **How to get a TIN** on page 2.

Note: *If the account is in more than one name, see the chart on page 2 for guidelines on whose number to enter.*

Vendors:
Dunn and Bradstreet Universal Numbering System (DUNS)

Social security number
☐☐☐-☐☐-☐☐☐☐

OR

Employer identification number
☐☐-☐☐☐☐☐☐☐

DUNS
☐☐☐☐☐☐☐☐☐

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), **and**
2. I am not subject to backup withholding because: **(a)** I am exempt from backup withholding, or **(b)** I have not been notified by the Internal Revenue Services (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or **(c**) the IRS has notified me that I am no longer subject to backup withholding, **and**
3. I am an U.S. person (including an U.S. resident alien).
4. I am currently a Commonwealth of Massachusetts's state employee: (check one): No____ Yes _____ If yes**, in compliance with** the State Ethics Commission **requirements.**

Certification instructions: You must cross out item **2** above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item **2** does not apply.

Sign Here	**Authorized Signature ▶**	**Date ▶**

Purpose of Form

A person who is required to file an information return with the IRS must get your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to give your correct TIN to the person requesting it (the requester) and , when applicable, to:

1. Certify the TIN you are giving is correct (or you are waiting for a number to be issued).
2. Certify you are not subject to backup withholding

If you are a foreign person, use the appropriate Form W-8. See **Pub 515**, Withholding of Tax on Nonresident Aliens and Foreign Corporations.

What is backup withholding? Persons making certain payments to you must withhold a designated percentage, currently 28% and pay to the IRS of such payments under certain conditions. This is called "backup withholding." Payments that may be subject to backup withholding include interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

If you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return, payments you receive will not be subject to backup withholding. **Payments you receive will be subject to backup withholding if:**

1. You do not furnish your TIN to the requester, or
2. You do not certify your TIN when required (see the Part II instructions on page 2 for details), or
3. The IRS tells the requester that you furnished an incorrect TIN, or
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends only), or
5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See the Part II instructions on page 2.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of Federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Name. If you are an individual, you must generally enter the name shown on your social security card. However, if you have changed your last name, for instance, due to marriage without informing the Social Security Administration of the name change, enter your first name, the last name shown on your social security card, and your new last name.

If the account is in joint names, list first and then circle the name of the person or entity whose number you enter in Part I of the form.

Sole proprietor. Enter your **individual** name as shown on your social security card on the "Name" line. You may enter your business, trade, or "doing business as (DBA)" name on the "Business name" line.

Limited liability company (LLC). If you are a single-member LLC (including a foreign LLC with a domestic owner) that is disregarded as an entity separate from its owner under Treasury regulations section 301.7701-3, **enter the owner's name on the "Name" line**. Enter the LLC's name on the "Business name" line.

Caution: *A disregarded domestic entity that has a foreign owner must use the appropriate Form W-8.*

Other entities. Enter your business name as shown on required Federal tax documents on the "Name" line. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on the "Business name" line.

Part I - Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box.

If you are a **resident alien** and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see **How to get a TIN** below.

If you are a **sole proprietor** and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are an **LLC** that is **disregarded as an entity** separate from its owner (see ***Limited liability company (LLC)*** above), and are owned by an individual, enter your SSN (or "pre-LLC" EIN, if desired). If the owner of a disregarded LLC is a corporation, partnership, etc., enter the owner's EIN.

Note: *See the chart on this page for further clarification of name and TIN combinations.*

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get **Form SS-5**, Application for a Social Security Card, from your local Social Security Administration office. Get **Form W-7**, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN or **Form SS-4**, Application for Employer Identification Number, to apply for an EIN. You can get Forms W-7 and SS-4 from the IRS by calling 1-800-TAX-FORM (1-800-829-3676) or from the IRS's Internet Web Site **www.irs.gov**.

If you do not have a TIN, write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments.

The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: *Writing "Applied For" means that you have already applied for a TIN* ***or*** *that you intend to apply for one soon.*

Part II - Certification

To establish to the paying agent that your TIN is correct or you are a U.S. person, or resident alien, sign Form W-9.

For a joint account, only the person whole TIN is shown in Part I should sign (when required).

Real estate transactions**.** You must sign the certification. You may cross out item 2 of the certification.

Dunn and Bradstreet Universal Numbering System (DUNS) number requirement –
The United States Office of Management and Budget (OMB) requires all vendors that receive federal grant funds have their DUNS number recorded with and subsequently reported to the granting agency. If a contractor has multiple DUNS numbers the contractor should provide the primary number listed with the Federal government's Central Contractor Registration (CCR) at /www.ccr.gov . Any entity that does not have a DUNS number can apply for one on-line at http://www.dnb.com under the DNB D-U-N Number Tab.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to give your correct TIN to persons who must file information returns with the IRS to report interest, dividends, and certain other income paid to you, mortgage interest you paid, the acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA or MSA. The IRS uses the numbers for identification purposes and to help verify the accuracy of your tax return. The IRS may also provide this information to the Department of Justice for civil and criminal litigation, and to cities, states, and the District of Columbia to carry out their tax laws

You must provide your TIN whether or not you are required to file a tax return. Payers must generally withhold a designated percentage, currently 28% of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to a payer. Certain penalties may also apply.

What Name and Number to Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account)	The actual owner of the account or, if combined funds, the first individual on the account [1]
3. Custodian account of a minor (Uniform Gift to Minors Act)	The minor [2]
4. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee [1]
b. So-called trust account that is not a legal or valid trust under state law	The actual owner [1]
5. Sole proprietorship	The owner [3]
For this type of account:	**Give name and EIN of:**
6. Sole proprietorship	The owner [3]
7. A valid trust, estate, or pension trust	Legal entity [4]
8. Corporate	The corporation
9. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
10. Partnership	The partnership
11. A broker or registered nominee	The broker or nominee
12. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name, but you may also enter your business or "DBA" name. You may use either your SSN or EIN (if you have one).

[4]. List first and circle the name of the legal trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.)

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

If you have questions on completing this form, please contact the Office of the State Comptroller. (617) 973-2468.

Upon completion of this form, please send it to the Commonwealth of Massachusetts Department you are doing business with.

Commonwealth of Massachusetts
CONTRACTOR AUTHORIZED SIGNATORY FORM

This form is jointly issued and published by the Office of the Comptroller (CTR) and the Operational Services Division (OSD) as the default form for all Commonwealth Departments when another form is not prescribed by regulation or policy.

Notarized Signature for Individual, Sole-Proprietor or Single Member LLC
(must match Form W-9 tax classification)

Contractor Legal Name	Contractor Vendor/Customer Code (if available, not the Taxpayer Identification Number)

INSTRUCTIONS: Any Contractor, sole-proprietor, or an individual, must provide a notarized signature of the authorized person who can sign contracts and other legally binding documents related to the contract on the Contractor's behalf.

For privacy purposes **DO NOT ATTACH** any documentation containing personal information, such as bank account numbers, social security numbers, driver's licenses, home addresses, social security cards or any other personally identifiable information that you do not want released as part of a public record. The Commonwealth reserves the right to publish the names and titles of authorized signatories of contractors.

Signature (ink on paper) Contractor Signature as it will appear on contract or other documents **(Complete only in presence of notary)**	
Print Signatory's full legal name	Title

Certificate of Acknowledgement of Notary Public	
Before me, the undersigned notary public, the above named individual proved to me through satisfactory evidence of identification, to be the person whose name is signed above and acknowledged to me that (he)/(she) signed for its stated purpose.	
Print Notary Name	Notary Signature (ink on paper)
Date	My commission expires on

AFFIX NOTARY SEAL/STAMP

A copy of this document must be attached to the "record copy" of a contract filed with the department.

Commonwealth of Massachusetts
CONTRACTOR AUTHORIZED SIGNATORY LISTING

This form is jointly issued and published by the Office of the Comptroller (CTR) and the Operational Services Division (OSD) as the default form for all Commonwealth Departments when another form is not prescribed by regulation or policy.

Signature for Corporation (C or S), Partnership, Trust/Estate, Limited Liability Company (must match Form W-9 tax classification)

Contractor Legal Name	Contractor Vendor/Customer Code (if available, not the Taxpayer Identification Number or Social Security Number)

INSTRUCTIONS: Any Contractor (other than a sole-proprietor or an individual contractor) must provide a listing of individuals who are authorized as legal representatives of the Contractor who can sign contracts and other legally binding documents related to the contract on the Contractor's behalf. In addition to this listing, any state department may require additional proof of authority to sign contracts on behalf of the Contractor, or proof of authenticity of signature (a notarized signature that the Department can use to verify that the signature and date that appear on the Contract or other legal document was actually made by the Contractor's authorized signatory, and not by a representative, designee or other individual.)

For privacy purposes **DO NOT ATTACH** any documentation containing personal information, such as bank account numbers, social security numbers, driver's licenses, home addresses, social security cards or any other personally identifiable information that you do not want released as part of a public record. The Commonwealth reserves the right to publish the names and titles of authorized signatories of contractors.

There are three types of electronic signatures that will be accepted on this form: **1) Traditional "wet signature" (ink on paper); 2) Electronic signature that is either: a. hand drawn using a mouse or finger if working from a touch screen device; or b. An upload picture of the signatory's hand drawn signature; 3) Electronic signature affixed using a digital tool such as Adobe Sign or DocuSign.** Typed text of a name not generated by a digital tool, computer generated cursive, or an electronic symbol are not acceptable forms of electronic signature.

Authorized Signatory Name	Signature (Signature as it will appear on contract or other documents)	Title	Phone Number	Email Address

Acceptance of any payment under a Contract or Grant shall operate as a waiver of any defense by the Contractor challenging the existence of a valid Contract due to an alleged lack of actual authority to execute the document by the signatory.

I certify that I am a responsible authorized officer of the Contractor and as an authorized officer of the Contractor I certify that the names of the individuals identified on this listing are current as of the date of execution and that these individuals are authorized to sign contracts and other legally binding documents related to contracts with the Commonwealth of Massachusetts on behalf of the Contractor. I understand and agree that the Contractor has a duty to ensure that this listing is immediately updated and communicated to any state department with which the Contractor does business whenever the authorized signatories above retire, are otherwise terminated from the Contractor's employ, have their responsibilities changed resulting in their no longer being authorized to sign contracts with the Commonwealth or whenever new signatories are designated.

Please note you cannot self-certify your own signature as a single signer listed above.

Signature	Date
Print Name	Phone Number
Title	Email Address

A copy of this listing must be attached to the "record copy" of a contract filed with the department.

COMMONWEALTH OF MASSACHUSETTS

OFFICE OF THE COMPTROLLER

Electronic Funds Transfer (EFT) Authorization Agreement

Complete this form to enroll, modify, or terminate an existing in electronic funds transfer (EFT) agreement with the Commonwealth of Massachusetts Departments.

PART I: REASON FOR SUBMISSION – See Instructions on Page 2

New Enrollment ☐ Change Enrollment ☐ Cancel Enrollment ☐ **Document Included**: Voided Check ☐ Bank Letter ☐

PART II: ACCOUNT HOLDER INFORMATION- See Instructions on Page 2

Account Holder Legal Name:		DBA Name:	
Street Address:	City:	State:	Zip Code:
Account Holder Tax Identification Number (9 digits EIN or SSN)	EIN:	SSN:	

PART III: FINANCIAL INSTITUTION INFORMATION- See Instructions on Page 2

Financial Institution Name:		
Routing Number (only nine digits):	Account Number:	Account Type (Checking or Saving):

IF YOU ARE MODIFYING BANKING INFORMATION, YOU MUST INCLUDE YOUR OLD BANK INFORMATION OR YOUR REQUEST WILL BE RETURNED

Old Financial Institution Name:		
Old Routing Number (only 9 digits):	Old Account Number:	Old Account Type(Checking or Saving):

PART IV: VENDOR/CUSTOMER CONTACT INFORMATION: This is the person we will contact for any questions regarding this EFT – See Instructions on Page 2

Contact Person's Name:	Contact Person's Title:
Contact Person's Phone:	Contact Person's Email Address:

PART V: AUTHORIZATION- See Instructions on Page 2

By signing below, I hereby certify that the account(s) indicated on this form is under my direct control and access; therefore, I authorize the State Treasurer as fiscal agent for the Commonwealth of Massachusetts to initiate, change, or cancel credit entries to the account(s) as indicated on this form. For ACH debits consistent with the International ACH Transaction (IAT) rules check one:

☐ I affirm that payments authorized by this agreement are not to an account that is subject to being transferred to a foreign bank account.

☐ I affirm that payments authorized by this agreement are to an account that is subject to being transferred to a foreign bank account.

This authority is to remain in full force and effect until the Office of Comptroller (CTR) has received written notification from either me or an authorized officer of the organization of the account's termination in such time and in such a manner as to afford CTR a reasonable opportunity to act upon it.

Account Holder must sign and mail this EFT form and include a confirmation of account information on bank letterhead or a void check and mail to the Commonwealth Department you are doing business with.

Account Holder Authorized Signature:	Print Name: Title	Date:

PART VI: VERIFICATION FROM THE COMMONWEALTH DEPARTMENT – See Instructions on Page 2		
I hereby certify the Vendor/Customer is an authorized signatory and verified by internal records and verbal confirmation initiated by our department.		
VCC/VCM Document ID:	Three letter Department Code:	
Signature:_____ Print Name:_____	Title:_____ Phone #_____	Date:_____

INSTRUCTIONS FOR COMPLETING THE EFT AUTHORIZATION AGREEMENT

All EFT requests are subject to a 5 (five) day pre-certification period in which all accounts are verified by the qualifying financial institution before any direct deposits are made.

PART I: REASON FOR SUBMISSION

Indicate your reason for completing this form by checking the appropriate box: New EFT enrollment, a change to your EFT enrollment account information, or cancellation of your EFT enrollment.

PART II: ACCOUNT HOLDER INFORMATION

- Account Holder Name: Enter the accounts holder legal name (individual or business name), as reported
- to the Internal Revenue Service (IRS).
- DBA Name: Enter the DBA name if applicable.
- Street Address: Enter the account holder's street address.
- Enter the account holder's city, state, and zip code.
- Account Holder Tax Identification Number: Enter the tax identification number as reported to the IRS. If the business is a group, organization or corporation, provide the Federal employer identification number (EIN). If enrolling as an individual provide your Social Security Number.

PART III: FINANCIAL INSTITUTION INFORMATION

- Financial Institution Name: Enter your Financial Institution's name (this is the name of the bank or qualifying depository
- that will receive the funds).
  - **NOTE**: The account name to which EFT payments will be paid is to the name submitted on Part II of this form.
- Routing Number: Enter the bank or financial institutional nine-digit routing number, including applicable leading zeros.
- Account Number: Enter the account holder's account number with the financial institution, including applicable leading zeros.
- Account Type: Enter the account type (Checking or Saving).
- If account holder is changing the banking information, you must provide OLD banking information.
- Old Financial Institution Name: Enter your Financial Institution's name (this is the name of the bank or qualifying depository that will receive the funds).
- Old Routing Number: Enter the Old bank or financial institutional nine-digit routing number, including applicable leading zeros.
- Old Account Number: Enter the Old account holder's account number with the financial institution, including applicable leading zeros.
- Account Type: Enter the Old account type (Checking or Saving).
  - **NOTE**: Supporting bank documents must be in the account holder legal name only.
- If you do not submit this information, your EFT authorization agreement will be returned without further processing.

PART IV: CONTACT INFORMATION

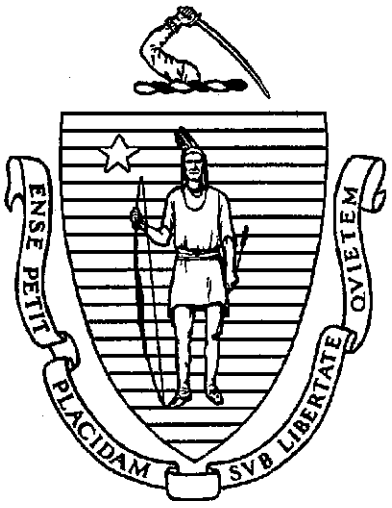
- Enter the name and title of a contact person who can answer questions about the information submitted on this EFT form.
- Enter the contact person's telephone number. Enter the contact person's e-mail address.

PART V: AUTHORIZATION

- By your signature on this form, you are certifying that the account is drawn in the Name of an Individual, or the Legal Business Name of the person or entity who has sole control of the account to which EFT deposits are made.
- The EFT authorization form must be signed and dated by the same account holder name in Part II and include a title and telephone number.
- Mail this form with the original signature in black or blue ink (no facsimile signatures can be accepted) to the Commonwealth Department that you doing business with.

PART VI: VERIFICATION FROM THE COMMONWEALTH DEPARTMENT

By your signature on this form, you are certifying that authentication of the vendor/customer's authorized signatory was conducted by review of the Contractor Signatory Authorization Form (CASL) or by another internal verification process, and additional verification was conducted to confirm banking or address change request. Departments should have multiple known vendor contacts to confirm any registration change.



BID PACKAGE

PART III

GENERAL CONDITIONS OF THE CONTRACT

CHAPTER 149

COMMONWEALTH OF MASSACHUSETTS
STANDARD VERTICAL CONSTRUCTION CONTRACT
For Projects Subject to M.G.L. c. 149, §§ 44A-F

GENERAL CONDITIONS OF THE CONTRACT
TABLE OF CONTENTS

ARTICLE I: DEFINITION OF TERMS **6**

ARTICLE II: EXECUTION OF THE CONTRACT, SCOPE OF WORK, INTERPRETATION OF CONTRACT DOCUMENTS **9**

1. Execution…….. 9
2. Scope of Work……..……. 9
3. Interpretation……. 9
4. Distribution of Work……. 10

ARTICLE III: CONTROL OF WORK / ADMINISTRATION OF THE CONTRACT **11**

1. Designer…… 11
2. Right of Access to Work…….. 11
3. Inspection No Waiver…….. 11

ARTICLE IV: GENERAL PERFORMANCE OBLIGATIONS OF THE CONTRACTOR **12**

1. Review of Contract Documents and Field Conditions……. 12
2. Supervision and Construction Procedures; Coordination; Cutting, and Patching……..…… 12
3. Superintendent…….. 13
4. Labor…… 14
5. Notices and Permits……..… 14
6. Lines, Marks Etc. …… 15
7. Excavation…… 15
8. Dewatering/Hoisting/Staging…….. 15
9. Corrections to The Work; Inspection No Bar to Subsequent Corrections…… 15
10. Sanitary Facilities……..… 16
11. Temporary Offices…….. 16

12. Contract Documents and Samples at the Site…….. 16
13. Telephones, Data Lines, and Wi-Fi……..… 17
14. Health, Safety, and Accident Prevention……..… 17
15. Debris and Chemical Waste……..… 20
16. Weather Protection (M.G.L. c. 149, §§ 44F(1) and 44G) 20
17. Furnishings and Equipment……. 21
18. Form for Subcontract…….. 21
19. Sales Tax Exemption and Other Taxes…… 21
20. Final Cleaning……. 21
21. Maintenance Data……. 22
22. Closeout Procedures……. 22
23. Risk of Loss……. 22
24. LEED Requirements……. 22
25. Electronic Project Management System…….…. 23
26. Drugs/Alcohol…….. 23

ARTICLE V: MATERIALS AND EQUIPMENT 23
1. Materials Generally……. 23
2. Shop Drawings, Product Data, and Samples……..… 23
3. Tests…… 25
4. "Or Equal" Submissions…….. 25
5. Delivery and Storage of Materials; Inspection…… 26
6. Defective, Damaged, or Deteriorated Materials and Rejection Thereof…… 28

ARTICLE VI: PROSECUTION AND PROGRESS 28
1. Beginning, Progress Schedule, and Completion of Work……. 28
2. Failure To Complete Work On Time - Liquidated Damages…….. 30
3. Delays; Statutory Provisions (M.G.L. c. 30, § 39O) …..… 31
4. Use and Occupancy Prior to Final Acceptance…… 32
5. Certificate of Substantial Completion……..… 32
6. Final Acceptance of the Work……..… 34
7. One Year Warranty Repair List and Inspection……... 35

ARTICLE VII: CHANGES IN THE WORK 35
1. Change Orders Generally……. 35
2. Methods of Computing Equitable Adjustments…….. 36
3. Work Performed under Protest…… 38
4. False Claims, Statutory Provisions Regarding Changes….. 39
5. Mandatory Mediation…….. 41

ARTICLE VIII: PAYMENT PROVISIONS 41
1. Schedule of Values……... 41
2. Payment Liabilities of the Contractor……..… 42
3. Retention of Moneys by Awarding Authority……..… 42
4. Applications for Payment……. 43
5. Periodic Payments (M.G. L. c. 30, § 39K) ……..… 44
6. Payment of Subcontractors (M.G.L. c. 30, § 39F) ……..… 46
7. Contracts For Public Works governed by M.G.L. c. 30, 49

§39G…….
8. Final Payment; Release of Claims by Contractor…… 52

ARTICLE IX: GUARANTEES AND WARRANTIES 52
1. General Warranty…….…. 52
2. Special Guarantees and Warrantees…….. 53

ARTICLE X: MISCELLANEOUS LEGAL REQUIREMENTS 53
1. Contractor to Be Informed…….. 53
2. Compliance with All Laws…….. 53

ARTICLE XI: CONTRACTOR'S ACCOUNTING METHOD REQUIREMENTS (M.G.L. c. 30, § 39R) 59
1. Definitions…… 59
2. Record Keeping…… 59
3. Statement of Management Controls……..… 60
4. Annual Financial Statement……..… 60
5. Bid Pricing Materials…….. 60

ARTICLE XII: EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM [EXECUTIVE ORDERS 524 & 565] (See Appendix A) 61

ARTICLE XIII: GOALS FOR PARTICIPATION BY MINORITY BUSINESS ENTERPRISES AND WOMEN BUSINESS ENTERPRISES [M.G.L. C. 7C, § 6 & EXECUTIVE ORDERS 524 & 565] (See Appendix B) 61

ARTICLE XIV: INSURANCE REQUIREMENTS 61
1. Insurance Generally…….. 61
2. Contractor's Commercial General Liability…….. 62
3. Automobile Liability……. 63
4. Contractor’s Pollution Liability…… 63
5. Worker's Compensation…… 64
6. Builder's Risk/ Installation Floater/ Stored Materials…….. 64
7. Umbrella Coverage…….. 65
8. Additional Types of Insurance ……. 65

ARTICLE XV: INDEMNIFICATION 66
1. Generally…….. 66
2. Designer’s Actions……... 66
3. Survival…… 66

ARTICLE XVI: PERFORMANCE AND PAYMENT BONDS 67
1. Contractor Bonds…….. 67
2. Subcontractor Bonds……. 67

ARTICLE XVII: TERMINATION OF THE CONTRACT 68
1. Termination for Cause……..… 68
2. Termination for Convenience……... 69

3. Contractor's Duties upon Termination for Convenience…. 70

ARTICLE XVIII: MISCELLANEOUS PROVISIONS 70
1. No Assignment by Contractor……...… 70
2. Non-Appropriation……... 70
3. Claims by Others Not Valid……...… 71
4. No Personal Liability by Public Officials……. 71
5. Severability……... 71
6. Choice of Laws…… 71
7. Standard Forms……. 71
8. No Waiver of Subsequent Breach……. 71
9. Remedies Cumulative……... 71
10. Notices…….. 72
11. Additional Information……..… 72
12. Information Confidential……...… 72
13. Consequential Damages…….. 73
14. Conflict of Interest…….. 73
15. Sexual Harassment and Workplace Violence Prevention… 73

APPENDICES

APPENDIX A EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM 75
1. Compliance Generally…… 75
2. Non-Discrimination and Affirmative Action…….…. 75
3. Liaison Committee, Reports and Records……..…. 76
4. Sanctions…… 77

APPENDIX B GOALS FOR PARTICIPATION BY MINORITY BUSINESS ENTERPRISES AND WOMEN BUSINESS ENTERPRISES 79
1. Goals…… 79
2. MBE/WBE Participation Credit……...… 79
3. Establishing MBE/WBE Status…… 80
4. Subcontractors With MBE/WBEs…… 80
5. Performance of Contract Work by MBE/WBEs…… 80
6. Notification of Changes in MBE/WBE Work…… 80
7. Actions Required If There Is A Reduction in MBE/WBE Participation……..…… 81
8. Suspension of Payment and/or Performance for Noncompliance…… 82
9. Liquidated Damages; Termination……... 82
10. Reporting Requirements……..… 83
11. Awarding Authority's Right to Waive Provision of this Article……. 83

- ~~Form of Subcontract MGL c.149 §44F~~
- ~~Procedure for Payment to Contractors~~
- ~~Payment Voucher Input~~
- ~~Requisition for Payment (DCAMM Form S1b) and Instructions~~
- ~~DCAMM Instructions and Procedure for Payment for Construction Contractors, including sample Schedule of Values~~
- Instructions and Procedures Regarding Change Orders, Contract Modifications and Equitable Adjustments (DCAMM Form 13)
- Request for Approval of Wages and Rates for Change Order Pricing (DCAMM Form 14)
- Format for Submission of Change Order (DCAMM Form 15) (3 pages)
- Change Order Log (1 Page)
- ~~Daily Time and Material Report for Change Orders 109/17 rev~~
- ~~Request and Agreement for a Change in the Plans~~
- Request and Agreement for a Change in the Plans and/or, Specifications and/or Contract
- (DCAMM Form 5)
- Weekly Payroll Report Form and Statement of Compliance
- ~~Quarterly Projected Workforce Table~~
- ~~Veteran and Service Disabled Veteran-Owned Business Enterprise~~
- ~~(VBE/SDVOBE) Participation~~
- ~~Form for Transfer of Title (Work Not Incorporated, DCAMM Form 16)~~
- Payroll & Workforce Report
- Payment Requisition Transmittal (3 pages)
- ~~Submittal Transmittal (1 page)~~
- Submittal Log
- Request for Information Transmittal (1 page)
- Request for Information Log
- ~~Weekly Site Meeting Template (1 Page)~~
- Certificate of Substantial Completion -E-1
- Certificate of Final Inspection, Release and Acceptance - E-2
- Certificate of Payment MBE, WBE, Veteran, Etc.
- Certificate of Payment to Subcontractors, Sub-Bidders, suppliers

END OF APPENDIX C

END OF TABLE OF CONTENTS.
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ARTICLE I
DEFINITION OF TERMS

Other terms, abbreviations and references are defined as they appear herein. Words and abbreviations that are not defined in the Contract Documents but which have recognized technical or trade meanings are used in accordance with those meanings.

The following words shall have the following meanings as used in this Contract:

Approval (or Approved): An approval in writing signed by the authorized signatory of the Awarding Authority.

Awarding Authority: The public agency awarding and administering this Contract identified as the Awarding Authority in the Contract. Where the Awarding Authority is an agency of the Commonwealth, references to the Awarding Authority shall also include the Commonwealth and its agencies.

Building Code: All applicable rules and regulations to which the Awarding Authority is subject and which are contained or referenced in the code authorized by M.G.L. c. 143, § 93 et seq., including all amendments thereto.

Certificate of Substantial Completion: A certificate signed by the Designer and the Awarding Authority pursuant to the requirements of Article VI of these General Conditions, indicating that the Awarding Authority has determined that (1) the Work has been completed in accordance with the Contract Documents, except for Punch List items, (2) certificates of inspection, testing and/or approval (including a certificate of occupancy under the Building Code), operating permits for any mechanical apparatus which may be required to permit full use and occupancy of the Work by its intended users (which in a Subcontractor's case may include the Contractor) have been delivered to the Awarding Authority, (3) any applicable written warranties, operating instructions and related materials have been delivered to the Awarding Authority, and (4) the Work may be used for its intended purpose without substantial inconvenience or interference.

Change Order: (1) A written order not requiring the consent of the Contractor, signed by an authorized representative of the Awarding Authority and designated as a Change Order, directing the Contractor to make changes in the Work within the general scope of the Contract, or (2) any written order from an authorized representative of the Awarding Authority that causes any change in the Work, provided that the Contractor has given the Awarding Authority written notice stating the date, circumstances, and source of the order and that the Contractor regards the order as a Change Order.

Change Order Request: Contractor's written request for a Change Order submitted in accordance with the requirements of Article VII of these General Conditions.

Contract: The Owner - Contractor Agreement executed between the Awarding Authority and the Contractor.

Contract Documents: The documents listed in Article 6 of the Contract.

Contract Modification: Any alteration of the Contract Documents accomplished by a written agreement properly executed by the parties to this Contract.

Contract Price: The Contract Price stated in Article 3 of the Contract which constitutes full compensation to the Contractor for everything to be performed and furnished in connection with the Work and for all damages arising out of the performance of the Work for which the Contractor is responsible, and constitutes the maximum compensation regardless of any difficulty incurred by the Contractor in connection with the Work or in consequence of any suspension or discontinuance of the Work.

Contractor: The person, corporation or other entity identified in the first page of the Contract as the "Contractor".

DCAMM: The Division of Capital Asset Management and Maintenance of the Commonwealth of Massachusetts. Where DCAMM is an agency of the Commonwealth, references to DCAMM shall also include the Commonwealth and its agencies.

Designer: The architect or engineer identified as the Designer in Article 1 of the Contract.

Drawings: The Drawings are the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including elevations, sections, details, schedules, and diagrams.

Final Acceptance: The written determination by the Awarding Authority that the Work has been 100% completed, except for the Contractor's indemnification obligations, warranty obligations, obligations to continue to maintain insurance coverage for the time periods provided in the Contract Documents, and any other obligations which are intended to survive Final Acceptance and/or the termination of the Contract.

General Bid: The completed bid form submitted by the Contractor in accordance with the requirements of M.G.L. c. 149.

Laws: All applicable statutes, regulations, ordinances, codes, laws, orders, decrees, approvals, certificates and requirements of governmental and quasi-governmental authorities.

Notice to Proceed: The written notice provided by the Awarding Authority to the Contractor which authorizes the Contractor to commence the Work as of a date specified therein, from which date the time of completion specified in Article 2 of the Contract is measured.

Or equal (or words of like import): Equal in the opinion of the Awarding Authority determined pursuant to the provisions of M.G.L. c.30, § 39M and the provisions of these General Conditions.

Owner: The Commonwealth of Massachusetts or political subdivision thereof, authority, or other instrumentality that will own the Work.

Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor or its Subcontractors and suppliers to illustrate materials or equipment for some portion of the Work. Product data also include any such information or instructions produced by the manufacturer or distributor of such materials or equipment and made readily available by said manufacturer or distributor.

Progress Schedule: The progress schedule submitted by the Contractor Approved by the Awarding Authority in accordance with the Contract Documents.

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

Punch List: A list of items determined by the Awarding Authority to be minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work for its intended purpose.

Resident Engineer: The on-Site representative of the Awarding Authority.

Samples: Physical examples, that illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.

Schedule of Values: The schedule Approved by the Awarding Authority pursuant to Article VIII of these General Conditions which allocates the Contract Price to the various portions of the Work and is used as a basis for payments to the Contractor.

Shop Drawings: Drawings, diagrams, details, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, sub-Subcontractor, manufacturer, supplier, or distributor to illustrate a portion of the Work.

Site: The land and, if any, building(s) or space within any such building(s) on which or in which the Contractor is to perform the Work.

Specifications: The portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards, and workmanship for the Work and performance of related services, including, without limitation, supplementary general conditions.

Subcontractor: Person or entity with whom the Contractor contracts in accordance with this Contract in order to perform the Work, except as otherwise specifically provided or required herein or by Law.

Substantial Completion: For work subject to M.G.L. c. 30, § 39K, "substantial completion" means that the value of the Work remaining to be done is, in the estimate of the Awarding Authority, less than one percent of the adjusted contract price and shall occur when (1) the Contractor fully completes the Work or substantially completes the Work, or (2) the Contractor substantially completes the work and the Awarding Authority takes possession for occupancy, whichever occurs first. For work subject to M.G.L. c. 30, § 39G "substantial completion" shall mean that the work required by the Contract has been fully completed, completed except for work having a Contract Price of less than one percent of the then adjusted total Contract Price, or substantially all of the Work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work.

Superintendent: The licensed construction supervisor who is an employee of the Contractor designated to be in full-time attendance at the Site throughout the prosecution and progress of the Work and who shall have complete authority to act for the Contractor.

User Agency: The department, county, commission, board, agency or other instrumentality of the Commonwealth of Massachusetts or political subdivision thereof which operates, or

which will operate, the facility at which the Work is undertaken or which comprises the completed Work.

Work: The Work consists of all the work identified in the Contract Documents, including, without limitation, as defined in Article 1 of the Contract and Article II, Section 2 of these General Conditions. The Work comprises the completed construction required by the Contract Documents and includes all labor, tools, materials supplies, equipment, permits and approvals, paperwork, calculations, submittals, and certificates necessary to develop, construct, and complete the Work in accordance with all Laws and all construction and other services required to be supervised, overseen, performed, or furnished by the Contractor or that the Contract Documents require the Contractor to cause to be supervised, overseen, performed or furnished.

ARTICLE II
EXECUTION OF THE CONTRACT, SCOPE OF WORK, INTERPRETATION OF CONTRACT DOCUMENTS

1. Execution.

The execution of the Contract by the Contractor is a representation that the Contractor has visited the Site, has become familiar with local conditions under which the Work is to be performed and has correlated personal observations at the Site with requirements of the Contract Documents.

2. Scope of Work.

The Work comprises the completed construction required by the Contract Documents and includes all labor, tools, materials, supplies, equipment, permits, approvals, paperwork, calculations, submittals, and certificates necessary to develop, construct and complete the Work in accordance with all Laws, and all construction and other services required to be supervised, overseen, performed or furnished by Contractor or that the Contract Documents require the Contractor to cause to be supervised, overseen, performed or furnished. The Contractor shall provide and perform for the Contract Price all of the duties and obligations set forth in the Contract Documents.

3. Interpretation.

A. The Drawings and Specifications and other Contract Documents are to be considered together and are intended to be mutually complementary, so that any work shown on the Drawings though not specified in the Specifications, and any work specified in the Specifications though not shown on the Drawings, is to be executed by the Contractor as a part of this Contract. Should a conflict occur in or between or among any parts of the Contract Documents that are entitled to equal preference, the better quality or greater quantity shall govern, unless the Awarding Authority directs otherwise. Figured dimensions shall take precedence over scaled dimensions.

B. All things that in the opinion of the Designer may be reasonably inferred from the Drawings, Specifications and other Contract Documents are to be executed by the Contractor. The Designer shall determine whether the detail Drawings conform to the general Drawings and Contract Documents, except as may be otherwise determined by the Awarding Authority.

C. The tables of contents, titles, headings and marginal notes or sub-scripts contained herein are solely to facilitate references, are not intended to be construed as provisions of the Contract, and in no way affect the interpretation of the provisions to which they refer.

D. Where reference is made in the Contract Documents to publications, standards, or codes issued by associations or societies, such reference shall be interpreted to mean the current edition of such publications, standards, or codes, including revisions in effect on the date of the issuance of the public notice inviting bids or proposals for the Work, notwithstanding any reference to a particular date. The foregoing sentence shall not apply to the dates, if any, specified with respect to insurance policy endorsement forms.

E. In case of any conflict among the Contract Documents, unless the context clearly otherwise requires, the Contract Documents shall be construed according to the following priorities:

First Priority:	Contract Modifications and Change Orders
Second Priority:	Contract, as amended
Third Priority:	General Conditions of the Contract, as amended
Fourth Priority:	Drawings, as amended -- schedules take precedence over enlarged detail Drawings, and enlarged detail Drawings take precedence over reduced scale Drawings; figured dimensions shall prevail over scale.
Fifth Priority:	Specifications, as amended

F. The Contractor shall refer to all of the Drawings, and to all of the sections of the Specifications, and shall perform all work reasonably inferable therefrom as being necessary to produce the indicated results. Neither the Awarding Authority nor the Designer assumes any liability arising out of jurisdictional issues raised or claims advanced by Subcontractors, trade organizations or other interested parties based on the arrangement or manner of subdivision of the content of the Specifications and Drawings. In the event of any claim arising out of any duplication, conflict, inconsistency or discrepancy within the Specifications or on the Drawings as to the allocation of the Work among the Subcontractors the Contractor shall be solely responsible for resolving the claim and shall be responsible for ensuring that all of the Work is completed, regardless of where it appears in the Specifications or on the Drawings.

4. Distribution of Work.

The distribution of the Work is intended to be described under the appropriate trades and, except for filed sub-bid work, may be redistributed, except as directed herein or as required by any applicable Laws, provided that such redistribution shall cause no controversy among the trades and no delay in the progress of the Work and is in the best interests of the Project.

ARTICLE III
CONTROL OF WORK / ADMINISTRATION OF THE CONTRACT

1. Designer.

Notwithstanding anything to the contrary expressed or implied in this Contract, any of the powers, rights, and duties of the Designer may be exercised by the Awarding Authority, provided that the Awarding Authority shall be under no obligation to do so. The Awarding Authority may rely on the Designer for the performance and exercise of its rights and obligations hereunder and shall be presumed to so rely on the Designer in the absence of an

explicit written assumption by the Awarding Authority of any such rights and obligations, except that any Approval required to be obtained from the Awarding Authority hereunder shall not be valid without the signature of the Awarding Authority. The Awarding Authority may explicitly overrule in writing any action, determination or decision of the Designer should the Awarding Authority choose to do so, except to the extent that the same would violate applicable Law. Subject to the foregoing, the Designer shall be responsible for the general administration of the Contract and shall perform the duties and exercise the rights herein conferred on the Designer. Except as otherwise specifically provided herein, the Designer shall decide all questions which may arise as to the conduct, quantity, quality, equality, acceptability, fitness, and rate of progress of the several kinds of work and materials to be performed and furnished under this Contract, and shall decide all questions which may arise as to the interpretation of the Drawings and Specifications and as to the fulfillment of this Contract on the part of the Contractor. In the case of the death, resignation, inability or refusal of the Designer to act, or the termination of his or her or its employment, the Awarding Authority may appoint another person to act as Designer for the purposes of this Contract. The Awarding Authority shall give written notice to the Contractor of any such appointment.

2. Right of Access to Work.

The Awarding Authority, the User Agency and the Designer (and persons designated by them) may for any purpose enter upon the Work, the Site, and premises used by the Contractor, and the Contractor shall provide safe facilities therefor. Other contractors of the Awarding Authority may also enter upon the same for the purposes which may be required by their contracts or work. Any differences or conflicts which may arise between the Contractor and other contractors of the Awarding Authority with respect to their work shall be initially resolved by the Designer.

3. Inspection No Waiver.

No inspection by the Awarding Authority or the Designer or employees or agents of either of them, and no order, measurement, certificate, approval, payment order, payment, acceptance or any other action or inaction of any of them, shall operate as a waiver by the Awarding Authority of any provision of this Contract.

ARTICLE IV
GENERAL PERFORMANCE OBLIGATIONS OF THE CONTRACTOR

The Contractor shall complete for the Contract Price all Work in a proper, thorough, and workmanlike manner in accordance with the Contract Documents. Without limiting the foregoing and without limiting the Contractor's obligations under any other provision of the Contract Documents, the Contractor shall for the Contract Price perform the following general obligations:

1. Review of Contract Documents and Field Conditions.

A. Before commencing the Work, the Contractor shall carefully study the Contract Documents and carefully compare all Specifications, Drawings, figures, dimensions, lines, marks, scales, directions of the Designer and Awarding Authority, and any other

information provided by the Awarding Authority and shall at once report to the Designer and Awarding Authority any questions, errors, inconsistencies, or omissions.

B. Before commencing the Work, the Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents and shall at once report to the Designer and Awarding Authority any questions, errors, inconsistencies, or omissions.

2. <u>Supervision and Construction Procedures; Coordination; Cutting, and Patching.</u>

A. The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and shall have control over, construction means, methods, techniques, sequences and procedures, and shall be responsible for coordinating all portions of the Work under the Contract.

B. The Contractor shall be responsible for the proper fitting of all Work and the coordination of the operations of all trades, Subcontractors, and materialmen engaged in the Work. The Contractor shall guarantee to each of its Subcontractors all dimensions which they may require for the fitting of their Work to all surrounding Work.

C. All necessary cutting, coring, drilling, grouting, and patching required to fit together the several parts of the Work shall be done by the Contractor, except as may be specifically noted otherwise under any particular filed sub-bid section of the Specifications.

D. The Contractor shall be responsible to the Awarding Authority for the acts and omissions of the Contractor's employees, agents and Subcontractors, and their agents and respective contractors' employees, and other persons performing portions of the Work or supplying materials therefor.

E. The Contractor shall be responsible for the inspection of portions of the Work already performed under this Contract to determine that such portions are completed in accordance with industry standards of good workmanship and the Contract Documents and in proper condition to receive subsequent Work.

F. The Contractor shall employ a registered land surveyor to perform any engineering required for establishing grades, lines, levels, dimensions, layouts, and reference points for the trades. The Contractor shall be responsible for maintaining benchmarks and other survey marks and shall replace any benchmarks or survey marks that may have become disturbed or destroyed. The Contractor shall verify the materials shown on the Drawings before laying out the Work and shall be responsible for any error resulting from its failure to exercise this precaution.

G. Unless otherwise required by the Contract Documents, or directed in writing by the Designer or the Awarding Authority, Work shall be performed during regular working hours, which, unless prescribed otherwise by applicable Law, shall be 7:00 a.m. to 5:00 p.m.. If the Contractor desires to carry on the Work outside of regular working hours or on Saturdays, Sundays, or Massachusetts or federal holidays, then the Contractor shall provide at least forty-eight (48) hours' notice to the Awarding Authority and Designer to allow satisfactory arrangements to be made for inspecting Work in progress and shall bear the costs of such inspection. The Awarding Authority at its election shall be entitled either to issue a credit Change Order to cover such cost or to withhold such cost from any further payments due the Contractor and/or to receive a payment from the Contractor of the amount of such cost.

H. Work performed outside of regular working hours set forth above without the consent or knowledge of the Designer and/or the Awarding Authority shall be subject to additional inspection and testing as directed by the Designer. The cost of this inspection and testing shall be borne by the Contractor whether the Work is found to be acceptable or not. The Awarding Authority at its election shall be entitled either to issue a credit Change Order to cover such cost or to withhold such cost from any further payments due the Contractor and/or to receive a payment from the Contractor of the amount of such cost.

3. Superintendent.

A. The Contractor shall employ a Superintendent whose appointment shall be subject to the Approval of the Awarding Authority. The Superintendent shall be in attendance at the Site full-time during the performance of the Work. The Superintendent shall represent the Contractor. Communications given to and from the Superintendent shall be deemed given to and from the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed upon written request in each case. The Superintendent shall attend each job meeting. The Superintendent shall be responsible for coordinating all of the Work of the Contractor and the Subcontractors.

B. The Superintendent shall be a competent employee regularly employed by the Contractor. The Superintendent shall be licensed in accordance with the Building Code and shall have satisfactorily performed similar duties on previous construction projects similar in type, complexity and scale to the Project. The Superintendent's resume shall be submitted to the Awarding Authority prior to commencement of construction together with such other information as the Awarding Authority may reasonably require in order to determine whether or not to Approve of his or her appointment. Any change in the Superintendent shall require the prior written consent of the Awarding Authority. The Contractor shall establish an emergency telephone line by which the Awarding Authority, the Designer, or their respective agents may contact the Superintendent during non-working hours.

4. Labor.

A. The Contractor shall employ only competent workers on the Project. The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall certify and ensure that all employees to be employed at the Site will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and the Contractor and each of its Subcontractors and others working on the Project shall furnish documentation of successful completion of said course by employees working with the first certified payroll report for each employee. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. Whenever the Designer shall notify the Contractor in writing that any worker is, in the Designer's opinion, incompetent, unfaithful, disorderly, or otherwise unsatisfactory, such employee shall be discharged from the Work and shall not again be employed on the Project except with the written consent of the Designer.

B. The Contractor shall employ a sufficient number of workers and shall ensure that all its Subcontractors employ a sufficient number of workers to carry on the Work with all

proper speed in accordance with Laws, the requirements of the Contract Documents, and the Progress Schedule.

C. The Contractor shall procure materials from such sources and shall manage its own forces and the forces of its Subcontractors and any sub-Subcontractors in such a manner as will result in harmonious labor relations on the Site. If union and nonunion workers are employed to perform any part of the Work, the Contractor shall establish and maintain separate entrances to the Site for the use of union and nonunion workers. The Contractor shall cause persons to be employed in the Work who will work in harmony with others so employed. Should the Work be stopped or materially delayed in the Awarding Authority's reasonable judgment due to a labor dispute, the Awarding Authority shall have the right to require the Contractor to employ substitutes acceptable to the Awarding Authority.

5. Notices and Permits.

A. The Contractor at its sole cost shall take out and pay for all approvals, permits, certificates and licenses required by Laws, pay all charges and fees, and pay for (or cause the appropriate Subcontractor to pay for) all utilities required for the proper execution of the Work.

B. The Contractor shall comply with all Laws and shall give all notices required thereby.

C. Except as otherwise specified in this Contract, it is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable Laws. However, if the Contractor observes that portions of the Contract Documents are at variance with the requirements of Laws, the Contractor shall promptly notify the Designer and Awarding Authority in writing, and necessary changes shall be accomplished by an appropriate Contract Modification.

D. If the Contractor performs Work knowing it to be contrary to Laws without giving such notice to the Designer and Awarding Authority, the Contractor shall bear full

responsibility for such Work and all costs attributable thereto, including, without limitation, corrections to the Work.

6. Lines, Marks etc.

The Contractor shall furnish batter boards and stakes and shall cause to be placed and maintained thereon so as to be easily read, such lines, marks and directions relating to the Work as the Designer shall from time to time direct. The Designer shall establish base lines and benchmarks on the Drawings for the locations of the Work but all other lines and grades shall be determined by the Contractor.

7. Excavation.

The Contractor shall prevent by sheeting and shoring or bracing, if necessary, any caving or bulging of the sides of any excavation made by the Contractor, leaving sheeting and shoring in place, or if any is removed, filling solid the spaces left thereby.

8. Dewatering/Hoisting/Staging.

The Contractor shall provide pumping, drainage, and disposal of all water and other flows so that no puddle, nuisance, or damage will be caused by water or flooding. The Contractor shall provide all hoisting equipment and machinery required for the proper execution of the Work. The Contractor shall provide all exterior and interior staging required to be over eight feet in height, except as may be otherwise provided in the Contract Documents.

9. Corrections to the Work; Inspection No Bar to Subsequent Corrections.

The inspection of the Work by the Designer, the Awarding Authority or their respective consultants shall not relieve the Contractor of its responsibilities to fulfill the Contract obligations. Defective work may be rejected by the Designer, the Awarding Authority, or their respective designated consultants, whether or not such work and/or materials have been previously overlooked or misjudged by the Designer, the Awarding Authority, or their respective consultants and accepted for payment. If the Work or any part thereof shall be found defective at any time before the Final Acceptance of the whole Work, the Contractor shall forthwith cease the performance of any defective work in progress and, whether or not such work is still in progress, shall forthwith correct such defect in a manner satisfactory to the Designer, the Awarding Authority, or their respective designated consultants. If any material brought upon the Site for use in the Work, or selected for the same, is rejected by the Designer, the Awarding Authority, or their respective consultants as unsuitable or not in conformity with the Contract Documents, or as damaged by casualty or deteriorated due to improper storage at the Site or to any other factor, the Contractor shall forthwith remove such materials from the Site. The Contractor shall pay for the cost of making good all work or property of other contractors or of the Owner destroyed or damaged by such removal or replacement; repair, finish and immediately make good any injury, defect, omission or mistake in the Work as soon as it is discovered; and complete and leave the Work in perfect condition.

10. Sanitary Facilities.

A. The Contractor shall provide and maintain sanitary facilities for all persons employed on the Work, beginning with the first worker at the Site. Said facilities shall meet the following requirements unless otherwise specified in the Specifications.

B. There shall be no fewer facilities than the number required by applicable Laws.

C. Facilities shall be kept in a clean sanitary condition at all times and shall be adequately screened to be inaccessible to flies.

(**Note:** If existing sanitary facilities at the Site are to be used by the Contractor, this requirement will be modified accordingly in the Specifications.)

11. Temporary Offices.

A. Except as otherwise specified in the Contract Documents, the Contractor shall erect the following temporary offices near the Site as directed by the Designer and adequately furnish and maintain them in a clean, orderly condition:

(1) A Contractor's field office at which Contractor's authorized representative shall be present at all times while work is in progress. Instructions, notices, and other communications delivered there by the Designer or the Awarding Authority shall be deemed delivered to the Contractor.

(2) The Contractor shall provide a separate conference room space with a conference table and chairs sufficient to accommodate 12 persons at one time.

B. The Contractor shall relocate the Resident Engineer's trailer, as well as services connected with said trailer, at no additional cost to the Owner if the need for relocation arises as determined by the Designer.

12. Contract Documents and Samples at the Site.

A reasonable number of sets of Contract Documents will be furnished to the Contractor by the Awarding Authority immediately after signing of the Contract, one of which shall be maintained at the Site for reference by authorized representatives of the Awarding Authority. The Contractor shall maintain at the Site for the use and information of the Awarding Authority one record copy of the Drawings, Specifications, addenda, Change Orders, Approved Shop Drawings, Product Data, Samples, updated Progress Schedule, and all other submittals, all in good order and marked currently to record changes and selections made during construction. These shall be available to the Designer and the Awarding Authority and shall be delivered to the Designer for submittal to the Awarding Authority upon completion of the Work. The Drawings, Specifications, and other documents prepared by the Designer and copies thereof furnished to the Contractor are for use solely with respect to this Project. The Contractor shall not permit their release to other parties except as may be necessary in dealing with governmental authorities in the ordinary course of permitting and constructing the Project. Further, they are not to be used by the Contractor or any Subcontractor or supplier on other projects without the specific written consent of the Awarding Authority and the Designer.

13. Telephones, Data Lines, and Wi-Fi.

The Contractor shall provide and maintain separate individual telephone, data and wi-fi service and pay for all calls, data service, and wi-fi service relating to the Work. Service and equipment shall meet the requirements, if any, of the Contract Documents and shall include provisions for incoming and outgoing calls and continually available wi-fi: (1) in the Contractor's field office for the use of its authorized agents and (2) in the Resident Engineer's office for the use of the Designer and authorized agents of the Owner.

14. <u>Health, Safety, and Accident Prevention</u>

A. In performing the Work, the Contractor shall:

(1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the U.S. Secretary of Labor by regulation;

(2) Protect the lives, health, and safety of other persons; and

(3) Prevent damage to property, materials, supplies, and equipment.

B. For these purposes, the Contractor shall:

(1) Comply with 84 Stat. 1590, the "Occupational Safety and Health Act of 1970" (OSHA) and with regulations and standards issued by the U.S. Secretary of Labor at 29 CFR Part 1926; and

(2) Comply with the trench safety law set forth in M.G.L. c. 82A and regulations promulgated by the Departments of Public Safety and Occupational Safety in 520 CMR 14.00 et. seq., which require at a minimum that: 1) all excavators obtain a permit for all trenches as defined; 2) all excavators must provide protections when trenches are unattended; and 3) authorizes fines for violations; the Contractor shall execute a “Trench Application and Permit” form included in Appendix C with the execution of this Contract.

(3) Include the terms of this Article IV.14 in every Subcontractor contract so that such terms will be binding on each Subcontractor.

(4) Designate by written notice to the Awarding Authority a responsible member of its organization at the Site whose duties shall include ensuring safety, implementation of Contractor’s safety plan referenced below and preventing accidents.

C. The Contractor shall maintain an accurate record of exposure data on all accidents incident to the Work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904. Without limiting the foregoing, the Contractor shall submit to the Awarding Authority without delay verbal and written reports of all accidents involving bodily injury or property damage arising in connection with the Work.

D. In any emergency affecting the safety of persons or property the Contractor shall immediately act in the exercise of reasonable judgment to prevent threatened damage, injury, or loss. The Contractor shall immediately notify the Awarding Authority of such emergency.

E. The Contractor shall be responsible for its Subcontractors’ compliance with the provisions of this Article IV.14.

F. Before commencing any portion of the Work on Site, the Contractor shall submit a written Project-specific plan for implementing this Article IV.14. The plan shall include an analysis of the significant hazards to life, limb and property inherent in the performance of the Work and a plan for controlling these hazards.

G. Without limiting the foregoing provisions of this Article IV.14, the Contractor shall comply with all health and safety Laws applicable to the Work. Without limitation:

(1) If the Contractor uses, stores or encounters toxic or hazardous substances it shall comply with M.G.L. c. 111F, § 2, the "Right to Know" law and regulations promulgated by the Department of Public Health, 105 CMR 670, the Department of Environmental Protection, 310 CMR 33, and the Department of Labor and Workforce Development, 441 CMR 21; and shall post a “workplace notice” obtainable from the Department of Labor and Workforce Development.

(2) The Contractor shall comply with the Federal Resource Conservation and Recovery Act, the Federal Comprehensive Environmental Response, Compensation and Liability Act, M.G.L. c. 21C, M.G. L. c. 21E, and any other Laws affecting toxic or hazardous materials, solid, special or hazardous waste. Should the Contractor discover unforeseen materials subject to the aforementioned hazardous materials laws at the Site, the Contractor shall immediately comply with any and all requirements for dealing with such materials and notify all required governmental authorities and the Awarding Authority of such discovery.

(3) The Contractor shall be responsible for the location of all utilities in connection with the Work. Without limiting the foregoing, the Contractor shall comply with Dig-Safe Laws. Dig-Safe is the Utility Underground Plant Damage Prevention System, 331 Montvale Road, Woburn, MA, 01801, 1-888-344-7233. The Contractor shall notify Dig-Safe of contemplated excavation, demolition, or explosive work in public or private ways, and in any utility company right of way or easement, by certified mail, with a copy to Department of Environmental Protection . This notice shall be given at least 72 hours prior to the work, but not more than sixty days before the work is to be done. Such notice shall state the name of the street or the route number of the way and shall include an accurate description of the location and nature of the proposed work. Dig-Safe is required to respond to the notice within 72 hours of receipt by designating the location of pipes, mains, wires or conduits at the Site. The Contractor shall not commence work until Dig-Safe has responded. The work shall be performed in such manner and with reasonable precautions taken to avoid damage to utilities under the surface at the work location. The Contractor shall provide the Superintendent with current Dig-Safe regulations, and a copy of M.G.L. c. 82, § 40. Any costs related to the services performed by Dig-Safe shall be borne by the Contractor.

(4) The Contractor shall comply with M.G.L. c. 149, § 129A, relative to shoring and bracing of trenches.

H. Without limiting the Contractor’s responsibilities described above, the Contractor shall take all reasonable precautions for the safety of, and the prevention of injury or damage to (i) all agents and employees and contractors on the Work and all other persons who may be affected thereby including the general public, (ii) all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the Site, under the care custody or control of the Contractor or any of its Subcontractors or any contractors directly or indirectly contracting through any of them, and (iii) other property at the Site

or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of the Work. The Contractor shall promptly remedy all damage or loss to any such property caused in whole or in part by the Contractor, any Subcontractor, or anyone directly or indirectly contracted or employed by any of them or by anyone for whose acts any of them may be liable. Without limiting the foregoing, the Contractor shall:

(1) post and maintain adequate danger signs and other warnings against hazards;

(2) promulgate safety regulations and give appropriate notices to the Awarding Authority and users of adjacent utilities and property;

(3) ensure the adequate strength and safety of all scaffolding, staging and hoisting equipment, temporary shoring, bracing and tying;

(4) protect adjoining private or public property;

(5) provide barricades, temporary fences, and covered walkways required by prudent construction practices, Laws and/or the Contract Documents;

(6) furnish approved hard hats and other personal protective equipment, furnish approved first aid supplies, furnish the name of the first aid attendant, and maintain a posted list of emergency facilities;

(7) provide proper means of access to property where the existing access is cut off by the Contractor;

(8) maintain from the beginning of any darkness or twilight through the whole of every night sufficient lights on or near any obstruction so as to guard and protect travelers from injury from such obstruction;

(9) maintain adequate security at the Site so as not to expose the Work and surrounding property to vandalism or malicious mischief;

(10) provide adequate fire protection procedures during the use of cutting torches, welding equipment, plumbers' torches and other flame and spark producing apparatus;

(11) take prompt action to correct any dangerous or hazardous conditions.

I. The Contractor shall not use or store explosives in the performance of the Work unless the Contractor first obtains the Awarding Authority's prior written specific Approval. If the Awarding Authority Approves the use or storage of explosives during the performance of the Work, the Contractor shall first comply with all Laws and obtain all permits, approvals, and certificates required in connection with the same and shall exercise best efforts, including but not limited to the employment and supervision of properly qualified personnel, to prevent damage, injuries, and accidents involving said explosives.

J. The Contractor shall not permit cutting or welding in or immediately adjacent to existing property of the Owner, Awarding Authority or of anyone else without the Awarding Authority's prior Approval in each instance.

15. <u>Debris and Chemical Waste.</u>

A. The Contractor shall not permit the accumulation of interior or exterior debris. The Contractor shall keep the Work area clean at all times. Without limitation, garbage shall be removed daily.

B. The Contractor shall properly classify and remove debris and waste from the Site and transport and dispose of it, all in accordance with Laws, employing a qualified and properly licensed transporter, at any landfill, disposal or recycling facility licensed under applicable Laws, including without limitation, hazardous materials Laws. The Contractor shall make all arrangements and give and obtain all notices, communications, documentation, permits, certificates, and approvals necessary for said disposal from the owner or officials in charge of such landfills, disposal or recycling facilities. The Contractor shall bear all fees and costs in connection with such classification, removal, transportation, disposal and storage. The Contractor shall not permit any storage of debris or waste except in accordance with Laws.

C. The Contractor shall not permit any open fire on the Site.

D. Chemical waste shall be stored in corrosion resistant containers, removed from the Site, and disposed of not less frequently than monthly unless more frequently required by Laws, including without limitation hazardous materials laws, or by the Contract Documents. Disposal of chemical waste shall be performed in accordance with requirements of the U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection. Fueling and lubricating of vehicles and equipment shall be conducted in a manner that affords the maximum protection against spills and evaporation. Lubricants shall be disposed of in accordance with procedures meeting all applicable Laws. The Contractor shall immediately notify the Designer and Awarding Authority of any hazardous materials release large enough to require reporting under applicable Laws. The Contractor shall be responsible for immediately cleaning up in accordance with Laws any oil or hazardous materials releases resulting from its operations. Any costs incurred in cleaning up any such releases shall be borne by the Contractor.

16. Weather Protection (M.G.L. c. 149, §§ 44F(1) and 44G).

The Contractor shall furnish and install "weather protection," which means temporary protection of that Work adversely affected by moisture, wind and cold. Weather protection shall be achieved in accordance with the Specifications, and at a minimum shall include covering, enclosing and/or heating working areas such that a minimum temperature of 40 degrees Fahrenheit (or higher temperature, if so stated in the Specifications) is maintained at the working surface during the months of November through March in order to permit construction to be carried on during such period in accordance with the Progress Schedule. After the building or portion thereof is completely enclosed by either permanent construction or substantial temporary materials having a resistance comparable to the specified permanent construction, the Contractor shall provide heat in accordance with the Specifications; if the Specifications do not specify a temperature range for this phase, the Contractor shall provide heat of not less than 55 degrees F. nor more than 75 degrees F. The foregoing provisions do not supersede any specific requirements for methods of construction, curing of materials and the like. Such weather protection shall be consistent with the Progress Schedule, shall permit the continuous progress of the Work necessary to maintain an orderly and efficient sequence of construction operations, shall include one thermometer for every two-thousand (2,000) square feet of floor space or fraction thereof (or as otherwise stated in the Specifications), shall be subject to the Approval of the Awarding Authority, and shall meet such additional requirements as may be specified by the Awarding Authority and by the Contract Documents.

17. Furnishings and Equipment.

When, in the opinion of the Designer, any portion of the Work is in a reasonable condition to receive fittings, furniture, or other property of the Owner not covered by this Contract, the Contractor shall allow the Awarding Authority to bring such fittings, furniture, and/or other property into such portions of the Work and shall provide all reasonable facilities and protection thereof. No such occupancy shall be construed as interfering with the provisions relating to time of completion, or as constituting an acceptance of the whole or any part of the Work. Any furniture or fittings so installed shall be placed in the Work at the risk of the Awarding Authority except that the Contractor shall be liable for damages or losses to such furniture or fittings to the extent such damages or losses arise in whole or in part from the negligence or intentional misconduct of Contractor, Subcontractors, their agents and/or employees, or anyone for whose acts Contractor is responsible.

18. Form for Subcontract.

The Contractor when subcontracting with sub-bidders filed pursuant to M.G.L. c. 149, § 44F shall use the form for subcontract in M.G.L. c. 149, § 44F(4)(c). The Contractor shall not interpret paragraph 3 of the statutory form of subcontract to require such sub-bidders to provide insurance with limits higher than the limits that are required by Article XIV of these General Conditions, assuming that the term "Contractor" therein refers to the sub-bidder and that the term "Contract Price" refers to the sub-bidder's price stated in paragraph 1 of the statutory form of subcontract.

19. Sales Tax Exemption and Other Taxes.

All building materials and supplies as well as the rental charges for construction vehicles, equipment and machinery rented exclusively for use on the Site, or while being used exclusively for the transportation of materials for the Work are entitled to an exemption from sales taxes under M.G.L. c. 64H, § 6(f). The Contractor shall take all action required to obtain the benefit of such sales tax exemption. The Contractor shall bear the cost of any sales taxes that Contractor incurs in connection with the Work and the Awarding Authority shall not reimburse the Contractor for any such taxes. The exemption number assigned to the Contractor as an exempt purchaser shall be provided to the Contractor by the Awarding Authority upon the written request of the Contractor.

20. Final Cleaning.

At the completion of the Work, the Contractor shall remove all waste materials, rubbish, tools, equipment, machinery and surplus materials, and professionally clean all sight-exposed surfaces so that the Work is clean and ready for occupancy. Subsequent to installation of User Agency furniture, telephones, and equipment, the Contractor shall provide such additional cleaning as may be necessary to remove any soil resulting from installation of such furniture, telephones and equipment. The Contractor shall comply with the detailed final cleaning requirements of the Specifications; in the event of any conflict

between the Specifications and this Section specifically with respect to cleaning at or after the completion of the Work, the Specifications shall apply.

21. Maintenance Data.

Subject to such additional requirements as may be provided in the Contract Documents, the Contractor shall compile four complete and identical binders of operating and maintenance

data for the entire Work, which shall include, at a minimum for all equipment and systems installed, complete operation and maintenance programs, including but not limited to operation and maintenance (O&M) manuals, records of any and all maintenance performed (whether by the Contractor or Subcontractors) between equipment installation and Final Acceptance, all as may be further detailed in the Specifications. The Contractor shall submit record maintenance data to the Designer for approval, shall submit approved maintenance data to the Awarding Authority, and shall instruct and train the User Agency's personnel in proper inspection and maintenance procedures in accordance with the training plan developed and Approved in accordance with the Specifications. If requested by the Awarding Authority, the Contractor shall also submit information on equipment and systems installed as the Work is performed in a format acceptable to the Awarding Authority, which shall be compatible for entry in the Capital Asset Management Information System (CAMIS), as may be further detailed in the Specifications.

22. Closeout Procedures.

The Contractor shall take all actions and submit all items required for the issuance of the Certificate of Substantial Completion and Final Acceptance as specified in the Contract Documents.

23. Risk of Loss.

The Contractor shall bear all risk of loss to the Work during the term of the Contract except for any portion of the Work as to which the Certificate of Substantial Completion has been issued pursuant to Article VI of these General Conditions of the Contract. Nothing herein shall limit the Contractor's responsibilities under Article IX or XV of these General Conditions of the Contract.

24. LEED Requirements.

Contractor understands that, pursuant to Executive Order No. 484, all new construction and renovation projects over 20,000 square feet must, at a minimum, meet a Massachusetts LEED Plus building standard, and that smaller projects must meet the minimum energy performance standards for advanced buildings established by the Commonwealth of Massachusetts Sustainable Design Roundtable. Furthermore, Contractor understands that the Massachusetts LEED Plus standard or a higher LEED standard applies to all projects overseen by DCAMM, as well as all projects built on state land for use by state agencies. Contractor must document compliance with this executive order and Project LEED certification standards as described in the Specifications.

25. Electronic Project Management System.

If so requested by the Awarding Authority, the Contractor and Subcontractors shall be required to use the Awarding Authority’s electronic web-based project management information system as a repository for Project correspondence, documentation, budgeting, and scheduling, and all submittals and processes under this Contract, as directed by the Awarding Authority.

26. Drugs/Alcohol.

The Contractor shall direct that all persons coming onto the Site are free of drugs and alcohol. The Contractor shall dismiss from the Project any individual employed by the Contractor or any Subcontractor or suppliers who is found by the Contractor, the Awarding Authority, or the User Agency to be in violation of this provision or in any other way incompetent, guilty of misconduct, or detrimental to the Project.

ARTICLE V
MATERIALS AND EQUIPMENT

1. Materials Generally.

A. Unless otherwise specifically provided in the Contract Documents, the Contractor shall provide and pay for materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

B. Materials and equipment to be installed as part of the Work (both or either of which are hereinafter referred to as "materials") shall be new, unused, of recent manufacture, assembled, and used in accordance with the best construction practices. The Contractor shall inform himself as to, and shall comply with, the provisions of M.G.L. c. 7, § 23A, as amended, and shall abide by the same and all applicable rules, regulations and orders made thereunder in relation to the purchase of supplies and materials in the execution of the Work, including the provisions of M.G.L. c.7, § 22, paragraph 17 which provides that there be *"a preference in the purchase of supplies and materials, other considerations being equal, in favor, first, of supplies and materials manufactured and sold within the Commonwealth, and, second, of supplies and materials manufactured and sold elsewhere within the United States."*

2. Shop Drawings, Product Data, and Samples.

A. The Contractor shall furnish to the Designer all Samples of the materials to be used in the execution of the Work as required by the Contract Documents. The Contractor shall furnish to the Designer in a timely manner all coordination Drawings, shop details, Shop Drawings, and setting diagrams which may be necessary for acquiring and installing materials. These shall be reviewed as required by the Designer. Unless otherwise specified by the Awarding Authority, the Contractor shall provide a minimum of four (4) copies when submitting for final approval by the Designer, one of which shall be returned to the Contractor, one to the Resident Engineer, one to the Awarding Authority and one filed with the Designer. The inspection and approval by the Designer of Shop Drawings and setting diagrams shall be general and shall in no way relieve the Contractor from responsibility for proper fitting, coordinating, construction, and construction sequencing. The Contractor shall furnish to the Designer such information and vouchers relative to the Work, the materials therefor, and the persons employed thereon, as the Designer shall from time to time request.

B. Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. The purpose of their submission is to demonstrate for those portions of the Work for which submittals are required the way the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

C. The Contractor shall review, approve, and submit to the Designer, Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Awarding Authority or of separate contractors. Submittals made by the Contractor which are not required by the Contract Documents or which do not comply with the Contract Documents may be returned without action. The Contractor's attention is directed to the provisions of Section 4 of this Article V and to the Specifications.

D. The Contractor shall prepare and keep current for the Designer's approval a schedule of submittals which is coordinated with the Progress Schedule and allows the Designer reasonable time to review submittals.

E. The Contractor shall perform no portion of the Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Designer. Such Work shall be in accordance with approved submittals.

F. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements, and field construction criteria related thereto and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

G. The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Designer's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Designer in writing of such deviation at the time of submittal and the Awarding Authority has given explicit written approval to the specific deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals by the Designer's or the Awarding Authority's actions.

H. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Designer on previous submittals.

I. Informational submittals upon which the Designer is not expected to take responsive action may be so identified in the Contract Documents.

J. When professional certification of performance criteria of materials, systems or equipment is required by the Contract Documents, such certification must be stamped by a registered Massachusetts professional in the discipline required. The Designer shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

K. Materials furnished or used or employed under the Contract must be equal in quality to the Samples furnished and be satisfactory to the Designer.

3. <u>Tests.</u>

A. Any material to be used in the Work may be tested or inspected at any time by the Designer with the prior Approval of the Awarding Authority and may be rejected if it fails to comply with specified tests. The Awarding Authority shall pay for all testing of specified material, except as provided herein. If the Contractor requests permission to use a material that was not specified, then the Contractor shall pay for such testing. The cost of testing of materials that fail the testing criteria shall be borne by the Contractor

B. The Contractor shall notify the Designer and the Awarding Authority of the proposed sources of materials in time to permit all required testing and inspection before the material is needed for incorporation into the Work. The Contractor shall have no claim arising from Contractor's failure to designate the proposed source or to order the material in time for adequate testing and inspection. Necessary arrangements shall be made to permit the Designer to make factory, shop or other inspection of materials or equipment ordered for the Work in process of manufacture or fabrication, or in storage elsewhere than the Site.

4. "Or Equal" Submissions.

A. Where products or materials are prescribed by manufacturer name, trade name, or catalog reference, the words "or Approved equal" shall be understood to follow. An item shall be considered equal to the item so named or described if in the opinion of the Awarding Authority (a) it is at least equal in quality, durability, appearance, strength and design, (b) it performs at least equally the function imposed in the general design for the Work, and (c) it conforms substantially, even with deviations, to the detailed requirements for the items as indicated by the Specifications. Any changes in the Work made necessary to accommodate products or materials substituted as an "or equal" shall be at the expense of the Contractor. "Approved equal" shall mean an item with respect to which the Awarding Authority shall have issued a written statement to the Contractor to the effect that the item is, in the Awarding Authority's opinion, equal within the meaning of this paragraph to that prescribed in the Contract Documents.

B. The Contractor shall be responsible for providing the Designer with any information and test results that the Designer reasonably requires to determine whether or not a material is equal to a material named or described in the Contract Documents.

C. Whenever the Contractor submits a material for Approval as a substitute for a material named or described in the Contract Documents, such submission shall be made at least one hundred twenty (120) days prior to the date the materials will be used in the Work. In no event shall the Contractor maintain a claim for delays based upon the Designer's review of such substituted materials if the Contractor has failed to comply with the one hundred twenty (120) day submission requirement.

D. The Contractor shall save the written calculations, pricing information, and other data that the Contractor used to calculate the General Bid (the "Bid Pricing Materials") for at least six years after the Awarding Authority makes final payment under this Contract. No increase in the Contract Price shall be allowed for any material later found to have been improperly rejected as not being equal unless the Contractor can show persuasive evidence that the rejection increased the Contractor's costs over those provided for in the Bid Pricing Materials, net of all savings the Contractor obtained by substituting other "or-equal" items. Without limiting the foregoing, if the Awarding Authority rejects a proposed substitution on the basis that the item is not equal and if after the Contractor complies with the appeal procedures required by law, DCAMM regulation, and by the Contract Documents, the appropriate authority finds that the proposed substitution was equal, the Contract Price may be increased only to the extent that:

(1) the item that the Contract Documents specifically require costs more than the item later approved as equal;

(2) the Bid Pricing Materials prove that the Contractor calculated its bid using the cost of the item later found as equal;

(3) any increase is reduced by any cost that the Contractor would have incurred for structural or mechanical changes necessary to accommodate the substitute item;

(4) the Contractor shall not be entitled to any adjustment for overhead and profit;

(5) any increase must exceed the aggregate amount that the Contractor saved using products or materials that the Awarding Authority approved as equal under this Contract.

In calculating the Contractor's aggregate saving under the preceding clause (5), the Contractor shall provide the Awarding Authority with the Bid Pricing Materials and a calculation based on the Bid Pricing Materials that compare the price (stated in the Bid Pricing Materials) of each item replaced with an "or equal" item, with the cost of the approved equal item, specifically describes all costs that Contractor would have incurred making structural or mechanical changes to include within the Work the item later found to have been improperly rejected and copies of all plans, specifications, shop drawings, and other design documents that the Awarding Authority deems necessary or desirable.

5. Delivery and Storage of Materials; Inspection.

A. Materials and equipment shall be progressively delivered to the Site so that there will be neither delay in the progress of the Work nor an undue accumulation of materials that are not to be used within a reasonable time and so that their security, quality, and fitness of the materials for the Work is preserved.

B. Materials stored off Site shall be insured and stored at the expense of the Contractor so as to guarantee the preservation of their security, quality and fitness for the Work. Without derogating from the Contractor's responsibilities in the previous sentence, when necessary to avoid deterioration or damage, material (on or off Site) shall be placed on wooden platforms or other hard clean surfaces and not on the ground and shall be properly protected.

C. The Contractor shall obtain prior written Approval for permission to store materials or equipment to be incorporated into the Work for which progress payments will be requested at off-Site locations. Any and all charges for storage, inspection, and verification by the Designer and Awarding Authority, including insurance, shall be borne solely by the Contractor. Before Approval, the Awarding Authority may require, without limitation

(1) evidence that the off-Site location is properly secure;

(2) proper proof of insurance and proof of satisfactory contractual arrangement for transportation to the Site; and

(3) a certificate from the Contractor stating: (i) the name of the member of the Contractor or Subcontractor that leases or owns the warehouse or other storage facility; (ii) the location of such storage facility, including the storage space (i.e. the entire premises or certain areas of a warehouse giving the number of floors or portions thereof) and a certification that the Contractor has visited such location, verified the storage of such materials or equipment therein or thereon (including confirmation that the materials or equipment are marked and segregated as provided below) and verified payment of all current storage charges; (iii) the date(s) on which the materials or equipment is first stored at such facility; and (iv) a description of the materials or equipment stored, including quantities, types, manufacturers and other identification information, such as serial numbers.

The Contractor shall furnish to DCAMM, not less often than once per month, a current inventory of all materials or equipment being stored at any off-Site location. The Contractor shall mark each sealed carton or other item with the name of the Project and the Awarding Authority, and all materials or equipment stored off-Site shall be segregated to the extent required by the Awarding Authority or the Designer. Payment for materials or equipment stored off-Site shall be at the reasonable discretion of the Awarding Authority, taking into account the schedule requirements of the Work. Title to materials or equipment stored off-Site shall be transferred at the time at which the Awarding Authority pays for them, free of any lien or other interest of the supplier or any other lien or encumbrance. Notwithstanding such transfer of title, the Contractor shall retain sole care, custody and control of, and shall have complete responsibility for the security and protection of, all materials or equipment included in any application for payment which are stored at locations other than the Site, and the Contractor assumes all risk of loss or damage to such materials or equipment, and the Contractor shall hold harmless the Awarding Authority from and against all liabilities arising out of or resulting from loss or damage, from any cause, to such materials or equipment for which payment is requested, including liens, security interests or other claims of any kind by suppliers or other third parties relating to such materials or equipment.

D. Expenses for inspection of material by the Designer and/or the Awarding Authority personnel including travel, quarters, and subsistence shall be borne by the Contractor requesting the inspection of material stored outside the Commonwealth of Massachusetts as part of the Contract Price. The policy of the Awarding Authority precludes the payment for material stored outside the boundaries of Massachusetts except in extremely limited circumstances with the express written consent of the Awarding Authority. If the Contractor requests an inspection of material stored outside the Commonwealth of Massachusetts, the Awarding Authority will initially pay for all expenses of inspecting the material incurred by the Designer and/or Awarding Authority's personnel including travel, quarters, and subsistence. The Awarding Authority will then give Contractor an invoice for those costs and the Contractor shall submit a credit Change Order in the amount of those expenses.

E. Stored materials either at the Site or at some other location agreed upon in writing shall be so located as to facilitate prompt inspection and even though approved before storage, may again be inspected prior to their use in the Work.

F. All storage sites shall be restored to their original condition by the Contractor at the Contractor's expense.

G. The Contractor shall take charge of and be liable for any loss of or injury to the materials for his use delivered to or in the vicinity of the place where the Work is being done, whether furnished by the Owner or otherwise; the Contractor shall notify the Designer as soon as any such materials are so delivered, allow them to be examined by the Designer, and furnish workers to assist therewith.

6. Defective, Damaged, or Deteriorated Materials and Rejection Thereof.

The Designer may reject materials if the Designer reasonably determines that such materials do not conform to the Contract Documents in any manner, including but not limited to materials that have become damaged or deteriorated from improper storage whether or not such materials have previously been accepted. The Contractor at its own expense shall remove rejected materials from the Work. No rejected material, the defects of which have been

subsequently corrected, shall be used except with the written permission of the Designer. Should the Contractor fail to remove rejected material within a reasonable time, the Designer and/or Awarding Authority may, in addition to any other available remedies, remove and/or replace the rejected material, and deduct the cost of such removal and/or replacement from any moneys due or to become due the Contractor. No extra time shall be allowed for completion of Work by reason of such rejection. The inspection of the Work shall not relieve the Contractor of any of its obligations herein prescribed, and any defective Work shall be corrected. Work not conforming to the Contract Documents may be rejected notwithstanding that such Work and materials have been previously overlooked or misjudged by the Designer and accepted for payment. If the Work or any part thereof shall be found defective at any time before Final Acceptance of the whole Work, the Contractor shall forthwith make good such defect in a manner satisfactory to the Designer. Nothing in the Contract shall be construed as vesting in the Contractor any property rights in the materials used after they have been attached or affixed to the Work or the Site; but all such materials shall upon being so attached or affixed become a property of the Owner.

ARTICLE VI
PROSECUTION AND PROGRESS

1. Beginning, Progress Schedule, and Completion of Work.

A. The Contract time shall commence upon the date specified in the Notice to Proceed. The Contractor shall begin Work at the Site within ten days of said date unless otherwise ordered in writing by the Awarding Authority.

B. Prior to the submission of the first progress payment, the Contractor shall submit to the Designer and to the Awarding Authority, a progress schedule for the term of the Contract as required by the Contract Documents, showing in detail his proposed progress for the construction of the various parts of the Work and the proposed times for receiving required materials. Upon Approval by the Awarding Authority, said schedule shall constitute the Progress Schedule. The Contractor shall at the end of each month, or more often if required, furnish to the Designer and to the Awarding Authority a schedule meeting the requirements of the Specifications showing the actual progress of the parts of the Work in comparison with the Progress Schedule.

C. Time is of the essence of this Contract. The Work shall be completed within the time specified in Article 2 of the Contract. Should the Contractor require additional time to complete the Work, the Contractor shall document the reasons therefor and submit a written request for an extension of time within 20 days of the occurrence of the event alleged to be the cause of the delay, as provided in this Article and in Article VII of these General Conditions. Failure to submit said written request within the time required by the preceding sentence shall preclude the Contractor from subsequently claiming any time extension due to said delay.

D. If, in the opinion of the Designer or the Awarding Authority, the Contractor fails to comply with the Progress Schedule, the Awarding Authority may give the Contractor a written notice to that effect whereupon (1) the Contractor shall, if the notice requires, discontinue all or any portion of the Work (which discontinuance shall neither terminate the Contract nor give the Contractor any claim for an increase in the Contract Price, damages, or an extension of any completion deadlines); or (2) at Contractor's sole cost increase the work force, equipment and plant, or any of them, employed on the whole or any part of the Work, to the extent required by such notice, and employ the same from

day to day until the completion of the Work or such part thereof, or until the failure regarding the rate of progress, in the opinion of the Designer or the Awarding Authority, shall have been sufficiently corrected.

E. If, in the opinion of the Awarding Authority, the Contractor fails to comply with the Progress Schedule, and whether or not the Awarding Authority shall have given the Contractor a notice described in D above, the Awarding Authority may (but shall not be required to) give the Contractor notice of such failure and five days to cure the same. Unless the Contractor shall within that five days take all necessary steps to do so (including, if the Awarding Authority requires, increasing its forces, equipment and plant) and continue to do so until in the opinion of the Awarding Authority the failure is corrected, the Awarding Authority may at the Contractor's expense and without terminating this Contract take exclusive or joint possession of all or a portion of the Site and employ and direct the labors of existing or such additional forces, equipment and plant as may in the Designer's or Awarding Authority's opinion be necessary to ensure the completion of the Work or such part thereof within the time specified in the Contract Documents or at the earliest possible date thereafter. The Awarding Authority may exercise its rights under this Article at any time and from time to time without waiving any of its rights under this Contract, at law or in equity, including, without limitation, the right to deem this Contract terminated or to order the Contractor to discontinue the Work at any time thereafter. The Contractor shall continue to perform the remaining Work under this Contract even if the Awarding Authority elects to have another contractor perform a portion of the Work under this Article.

F. The Awarding Authority shall deduct the cost of any actions the Awarding Authority takes under this Article from any amount then due or which might have become due to the Contractor under this Contract had the Contractor performed as required. On demand, the Contractor shall pay the Awarding Authority any amount by which the cost of completing all or any portion of the Work exceeds the amount attributable to that Work under the Contract Documents. The Awarding Authority's sole goal will be to complete the Work that it elects to complete within the time limits stated in the Contract or at the earliest possible date thereafter. Consequently, the Awarding Authority shall have no obligation to obtain competitive bids or the lowest cost for completing the Work or any part thereof, except when it is required by Law. The Awarding Authority's election to complete all or part of the Work shall not release the Contractor from any liability for failure to complete the Work as the Contract Documents require, and shall not entitle the Contractor to a claim for an increase in the Contract Price or an extension of the time for completing the Work. If the cost that the Awarding Authority incurs in completing all or any portion of the Work is less than the amount that the Contract Documents attribute to that Work, the Awarding Authority will pay or credit the difference to the Contractor, less any other costs and expenses that the Awarding Authority incurs, including the cost of supervision, and the Designer’s and attorneys' fees and costs.

2. <u>Failure to Complete Work on Time - Liquidated Damages.</u>

A. If the Contractor shall neglect, fail or refuse to achieve the Substantial Completion Date, the Contractor and the Contractor’s surety agree, as a part of the consideration for the execution of this Contract by the Awarding Authority, to pay the Awarding Authority the amounts set forth in Article 2 of the Contract, not as a penalty, but as liquidated damages to cover certain losses, expenses, and damages of the Awarding Authority for such breach of this Contract as herein set forth. The Contractor acknowledges that delay of the

Substantial Completion Date will cause disruption of the Awarding Authority's operations and those of the User Agency. Such disruptions include without limitation, loss of productivity and efficiency and duplication of effort of the User Agency and of employees and contractors engaged by the User Agency and the Awarding Authority for operation of the completed facility. The Awarding Authority and the User Agency will incur other direct administrative, professional, rental, storage, moving, transportation, and other costs in the event of such delay. Delay of the Substantial Completion Date will also require the Awarding Authority to incur additional costs for compensation to the Designer and other consultants or contractors for extended or additional services on the Project. In light of the costs, damages, losses, risks and liabilities described above, the parties agree upon the liquidated damages stated below. Such damages have been fixed and agreed upon because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Awarding Authority and the Commonwealth would, in such event, sustain. Said amounts may be retained by the Awarding Authority on or after the scheduled Substantial Completion Date from current progress payments or any other amounts owing to the Contractor.

B. Similarly, if the Contract states that by a specified date a designated portion of the Work shall be prosecuted to the point at which it qualifies for the issuance of a Certificate of Substantial Completion, and if such portion has not been prosecuted to such point by said date, the Contractor shall pay to the Awarding Authority the sum designated in the Contract for each calendar day that the Contractor is in default in completing such portion of the Work to such point. Such moneys shall also be paid as liquidated damages not as a penalty, to cover losses and expenses to the Owner resulting solely from the fact that the Work is not completed on time.

C. The Awarding Authority may recover such liquidated damages by deducting the amount thereof from any moneys due or that might become due the Contractor, and if such moneys shall be insufficient to cover the liquidated damages, then the Contractor or the Surety shall pay to the Awarding Authority the amount due.

D. Except as otherwise expressly provided, none of the following shall constitute a waiver of the Contractor's or its surety's obligations to pay liquidated damages or any portion thereof or of any of the Owner's rights hereunder at law or in equity:

(1) Acceptance of any portion of the Work or payment to the Contractor or its surety therefor;

(2) Completion of a portion of the Work or the use and occupancy thereof by the Awarding Authority or others; or

(3) The Awarding Authority's requiring or allowing the Contractor or its surety to complete the Work.

E. Liquidated damages or a portion thereof may be waived by the Awarding Authority if the Contractor submits evidence satisfactory to the Awarding Authority that the delay was caused solely by conditions beyond the control of the Contractor and that the Awarding Authority has not suffered any damages as a result of said delay.

F. Failure by the Awarding Authority to specify a sum as liquidated damages in the Contract, or the insertion of "N/A" or "none" in the space provided therein for liquidated damages, shall not be deemed a waiver of the Awarding Authority's right to recover actual damages arising from the Contractor's failure to complete the Work on time.

3. <u>Delays; Statutory Provisions (M.G.L. c. 30, § 39O).</u>

A. Notwithstanding any provision of this Contract to the contrary, except as otherwise provided by Law as set forth in paragraph B below, the Contractor shall not be entitled to increase the Contract Price or to receive damages on account of any hindrances or delays, avoidable or unavoidable, including damages for compression or acceleration of Work, or loss of productivity; but if any delay is caused, in the opinion of Awarding Authority, by the Awarding Authority, the Contractor shall be entitled to an extension of time. The length of the extension shall be sufficient in the opinion of the Awarding Authority or the Contractor to complete the Work. Although no delay shall increase the Contract Price, the Awarding Authority may require that any change in the date by which the Contractor must complete all or any part of the Work be processed on a standard Change Order form.

B. If a suspension, delay, interruption or failure to act of the Awarding Authority increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the Contractor with respect to such increase as the Contractor shall have against the Awarding Authority by virtue of (a) and (b) of M.G.L. c. 30, § 39O set forth below, but nothing in provisions (a) and (b) shall alter any other rights which the Contractor or the subcontractor may have against each other. As used in the statutory language of (a) and (b) below, "contract" means this Contract, "general contractor" means the Contractor and "awarding authority" means the Awarding Authority:

"*(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided, however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.*

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim."

4. <u>Use and Occupancy Prior to Final Acceptance.</u>

A. The Contractor agrees to the use and occupancy of the Project or any portion thereof before Final Acceptance of the Work by the Awarding Authority.

B. The Awarding Authority and the User Agency will cooperate with the Contractor with respect to the completion of the Work by taking such reasonable steps as may be possible to avoid interference with the Contractor's Work provided that they do not interfere with the proper functioning of the facility.

C. The Contractor shall not be responsible for wear and tear or damage resulting solely from temporary occupancy.

D. Use and occupancy of any part of the Work prior to Final Acceptance by the Awarding Authority shall not relieve the Contractor from maintaining the required payment and performance bonds and insurance (to the extent that insurance is required to be maintained after Substantial Completion) required by this Contract.

5. <u>Certificate of Substantial Completion.</u>

A. When the Work, or portion thereof which the Awarding Authority agrees to accept separately has reached the state of Substantial Completion as shown on Approved payment request, the Contractor shall develop, with the participation of the Designer and the Awarding Authority, the Punch List identifying those items of unfinished or unacceptable Work that remain to be performed or corrected under the Contract.

B. Before the Work shall be deemed completed to the point where it is ready for the issuance of a Certificate of Substantial Completion, the Contractor shall:

(1) Provide Contractor's proposed Punch List containing a statement of the reason for each item listed thereon;

(2) Advise the Awarding Authority of proposed changes in insurance in accordance with the provisions of this Contract, and provide to the Awarding Authority evidence of Contractor's completed operations insurance coverage to the extent required by the Contract Documents;

(3) Execute and submit a notarized warranty on a form provided by the Awarding Authority or otherwise acceptable to the Awarding Authority meeting the requirements of Article IX of these General Conditions, to commence upon the date of the issuance of the Certificate of Substantial Completion for the Work or the designated portion thereof, unless otherwise provided in the Certificate of Substantial Completion;

(4) Submit signed special warranties and warranties of longer than one year as required by the Contract Documents;

(5) Submit signed maintenance agreements for all portions of the Work specified to receive maintenance after the issuance of the Certificate of Substantial Completion;

(6) Submit all preliminary record Drawings and documents and framed data in the forms required by the Contract Documents;

(7) Complete all items required to be completed by the Department of Public Safety and obtain a Certificate of Occupancy from the Department of Public Safety (or, if the Awarding Authority is a municipality, the building department having jurisdiction) and similar releases which permit the User Agency and the Awarding Authority full and unrestricted use of the areas claimed to be ready for occupancy;

(8) Deliver specified maintenance stocks of materials, required spare parts, and all special tools furnished by manufacturers to persons designated by the Awarding Authority and obtain written receipts for same;

(9) Make final changes of lock cylinders or cores and advise the Awarding Authority of the change of project security responsibility;

(10) Complete start-up of systems and instruct User Agency personnel on proper operation and routine maintenance of all systems and equipment; obtain and submit to User Agency personnel that start-up and instruction have been completed;

(11) Remove all remaining temporary facilities that are no longer needed, surplus materials, and debris (provided, however, that the Contractor shall not remove construction offices and trailers without the prior Approval of the Awarding Authority);

(12) Submit final utility meter readings and similar information and advise the User Agency and the Awarding Authority of the change of responsibility for utility charges and payments upon the issuance of the Certificate of Substantial Completion;

(13) Complete final clean-up of all Work, restoration of damaged finishes, and replacement of all damaged and broken glass not listed on the Contractor's Punch List.

(14) Complete such other items as may be called for in the Contract Documents, if any, including without limitation the Specifications.

C. After completing the items specified in subsections A and B above, the Contractor shall make a written request for the Designer's inspection for a Certificate of Substantial Completion in accordance with the Contract Documents. The Designer shall review the submittals and the Work and shall either 1) sign a Certificate of Substantial Completion or 2) notify the Contractor of incomplete and/or incorrect Work that must be completed and corrected prior to the issuance of the Certificate of Substantial Completion. The Designer shall notify the Contractor of any additions to the Punch List. In connection with the execution of the Certificate of Substantial Completion the Designer shall assign dollar values to each item on the Punch List. Failure to include any incomplete or defective item on the Punch List shall not relieve the Contractor of the obligation to complete all Work in accordance with the Contract Documents.

6. <u>Final Acceptance of the Work.</u>

A. Prerequisites for Final Acceptance. After the issuance of a Certificate of Substantial Completion for the entire Work, and after the Contractor has completed all of the Work required by this Contract, including Change Orders and Punch List items, the Contractor shall submit the following completed items to the Awarding Authority together with such additional items as may be specified in the Contract Documents:

(1) A completed final application for payment showing a final accounting of all changes in the Work, on the form provided by the Awarding Authority.

(2) Certification and satisfactory evidence that all taxes, fees, and similar obligations have been paid.

(3) Consent of the Contractor’s surety to final payment executed by applicable bonding companies.

(4) Certified copy of the Punch List stating that the Contractor has completed or corrected every item listed.

(5) Evidence of Contractor's continuing completed operations insurance coverage to the extent required by the Contract Documents.

(6) All final record Drawings and documents in the forms specified by the Contract Documents.

(7) A notarized certification that all purchases made under the tax exemption certificate were legitimate and entitled to exemption.

(8) Written certifications from the Department of Public Safety (or if the Awarding Authority is a municipality, the building department having jurisdiction) and the Designer to the effect that: a) the Work has been inspected for compliance with the Contract Documents and has satisfied the Department of Public Safety; b) all equipment and systems included in the Work have been tested in the presence of the Designer and are operational and satisfactory; c) the Work is completed and ready for final inspection.

(9) Such other items as may be required by the Contract Documents.

B. Reinspection; Final Acceptance. After notification from the Contractor that all remaining Contract exceptions, omissions and incompletions have been completed (with the exception of Contractor's continuing warranty, insurance, indemnification, and such other obligations as are intended by the terms of the Contract Documents to extend beyond the date of Final Acceptance), the Awarding Authority and the Designer shall inspect the Work to verify the completion of the same. If the Work is satisfactory, the Awarding Authority shall prepare a Certificate of Final Acceptance or shall notify Contractor in writing of items which remain to be completed prior to Final Acceptance.

7. <u>One-Year Warranty Repair List and Inspection.</u>

Approximately 30 days prior to the expiration of the comprehensive one-year warranty period, the Contractor shall schedule an appointment with the Awarding Authority for a re-inspection of the Work with the Awarding Authority, and shall thereafter inspect the work at the time scheduled. Based on this inspection and on prior inspections, the Awarding Authority shall issue a "Warranty Repair List" of items to be corrected by the Contractor. The Contractor shall make the repairs and/or replacements listed within 30 days of the issuance of the “Warranty Repair List” unless otherwise agreed by the Awarding Authority in writing.

<u>ARTICLE VII</u>
CHANGES IN THE WORK

1. <u>Change Orders Generally.</u>

A. No changes in the Work, the Contract Price, the Substantial Completion date, the Final Acceptance date, or any other provision of an Approval by the Awarding Authority of the Contract Documents shall be made in absence of a Change Order as defined in Article I of these General Conditions, directing the Contractor to perform such changes. Any request for a change in the provisions of this Contract submitted by the Contractor must be made in writing and in accordance with the provisions of this Contract, including the procedures of the Awarding Authority.

B. A request for a change in the provisions of this Contract may be submitted to the Awarding Authority by the Contractor, Designer, Resident Engineer or User Agency. The request must be made in writing and in accordance with the provisions of this Contract, Laws, and the procedures of the Awarding Authority. When the Contractor believes that

an event or circumstance gives rise to an adjustment in the Contract Price and/or the Contract time it shall submit a Change Order Request in accordance with the forms and procedures required by the Awarding Authority.

C. A written directive may be issued by the Awarding Authority instructing the Contractor to make changes in the Work within the general scope of the Contract, including but not limited to, changes in: (1) the Drawings and Specifications; (2) the method or manner of performance of the Work; (3) the Owner-furnished facilities, equipment, materials, services or Site; (4) the schedule for performance of the Work.

D. Whenever a Change Order or written directive will cause a change in the Contractor's cost, the Contractor or the Awarding Authority may request an adjustment in the Contract Price. Such request shall be in writing and shall be submitted by the party making such claim to the other party before commencement of the pertinent work.

E. The Awarding Authority and the Contractor shall negotiate in good faith an agreement on an equitable adjustment in the Contract Price, and/or time if appropriate, before commencement of the pertinent Work. In the absence of an agreement for an equitable adjustment, the Awarding Authority shall unilaterally determine the costs attributable to the change and provide the Contractor with a written notice to that effect. The Contractor may appeal the decision of the Awarding Authority within thirty days of receipt of said notice, to the chief executive official of the Awarding Authority (in the case of DCAMM, the DCAMM commissioner) or the chief executive's designee, and the Contractor shall have the right to such further appeal as is provided in M.G.L. c.30, § 39Q set forth in Article VII4.D. However, if the Contractor shall exercise its rights to appeal the decision of the Awarding Authority as aforesaid, the Contractor shall be required to engage in the mandatory mediation procedures set forth in Article VII.5.

F. During the negotiation of an equitable adjustment in the Contract Price, the Contractor shall provide the Awarding Authority with all cost, pricing data and any other information or documentation used by the Contractor in computing the amount of the equitable adjustment, and the Contractor shall certify that the pricing data used was accurate, complete, and current. If the Awarding Authority subsequently determines that the data submitted by the Contractor was inaccurate, incomplete, or not current, the Awarding Authority may exclude such data from consideration under the equitable adjustment request.

G. Whenever the Contractor is entitled or believes it is entitled to a Change Order adjusting the Contract Price, the Contractor shall maintain separate accounts (by job order or other suitable accounting procedure) of all costs incurred and attributable to such work and schedule. The Contractor shall maintain a computerized accounting system, acceptable to the Awarding Authority, in which current information as to the status of all such Work and schedule is maintained. The Contractor shall maintain such contemporaneous records as are necessary to provide a clear distinction between the costs of all Change Order Work and proposed Change Order Work, and the costs of other Work and schedule.

H. Notwithstanding any provisions in the Contract Documents to the contrary, no additional general conditions cost shall be due for any Change Order or portion of a Change Order resulting from or attributable to:

(1) Increases in the cost of allowance items;

(2) Substitutions of equipment or materials which are functionally similar to equipment or materials specified in the Contract Documents; or

(3) Sales and use taxes.

I. The Contractor shall reasonably investigate the validity of Subcontractor and supplier change order requests before agreeing to pass them through to the Awarding Authority. For all Change Order Requests submitted, the Contractor shall certify that: the Change Order Request is made in good faith; the validity of the Contractor's and any Subcontractor and supplier Change Order Requests have been verified; the supporting data is accurate and complete to the best of the Contractor's knowledge and belief; and the Contractor believes the Awarding Authority to be liable for the add amount, or entitled to the deduct amount of the Change Order Request, whichever is applicable.

2. <u>Methods of Computing Equitable Adjustments.</u>

A. Equitable adjustments in the Contract Price shall be determined according to one of the following methods, or a combination thereof, as determined by the Awarding Authority:

(1) fixed price basis, provided that the fixed price shall be inclusive of items (a) through (g) below and shall be computed in accordance with those provisions and as detailed in the Awarding Authority's instructions and procedures regarding Change Order Request submissions, Contract Modifications and equitable adjustments (For DCAMM Projects, DCAMM Form 13 included in Appendix C to these General Conditions);

(2) estimated lump sum basis to be adjusted in accordance with Contract unit prices or other agreed upon unit prices provided that the unit prices shall be inclusive of all costs related to such equitable adjustment;

(3) time and materials basis to be subsequently adjusted based upon of actual costs (but subject to a predetermined "not to exceed limit") calculated as follows:

(a) the direct cost (or credit) for labor at the minimum wage rates established for this Contract pursuant to M.G.L. c. 149, §§ 26-27H;

(b) plus (or minus) the cost of workmen's compensation insurance, liability insurance, federal social security and Massachusetts unemployment compensation, which are to be calculated using an allowance equal to 40% applied to said rate. The rate of 40 percent is inclusive of all insurances, taxes, general conditions, overhead, superintendence, fee, and profit. No other expenses are allowed; for example, sick time, vacation time, etc. are included in the all-inclusive rate. Documentation must be provided if a higher percentage is requested and will only be accepted for workmen's compensation over 12.5%.

(c) plus (or minus) the actual direct additional premium costs and expenses incurred as a result of collective bargaining agreements or other agreements between organized labor. No allowance for markups is allowed on these costs.

(d) plus the direct cost of materials and use of equipment; an allowance equal to 15% of the amount of materials and equipment for general conditions, overhead, superintendence, fee, and profit can be applied.

(e) plus certain miscellaneous services Approved in advance by the Awarding Authority (e.g. police details, utilities, etc.) and provided, which may be subject to a 5% markup.

(f) plus (or minus) the actual direct premium cost of payment and performance bonds required of the Contractor and certain Subcontractors for this Contract.

(g) the Contractor shall receive an allowance equal to 5% of the sum of items (a) through (e) above for overhead, superintendence, fee, and profit when the work is performed by Subcontractors. Subcontractors can also apply an allowance equal to 5% of the sum of items (a) through (e) above for overhead, superintendence, fee, and profit when the work is performed by sub-Subcontractors.

(4) The Contractor and its Subcontractors are required to anticipate annual updated minimum wage schedules in accordance with M.G.L. c. 149, § 27 and shall not be entitled to claim additional compensation for base bid contract Work due to updated minimum wage schedules.

B. If the net change is an increase to the Contract Price, it shall include the value of the Contractor's overhead, superintendence, fee and profit. On any change that involves a net credit, the amount of the credit shall include the hard cost of the work being credited and the value of the overhead, superintendence, fee and profit applicable thereto (calculated as an agreed upon percentage multiplied by such hard cost of the work). Charges for small tools known as "tools of the trade" are not to be computed in the amount of any change in the Contract Price.

C. Substitutions in Subcontractors made in accordance with the provisions of M.G.L. c. 149, § 44F shall not be considered Change Orders and shall not entitle the Prime Contractor to any adjustments for overhead, profit, and superintendence, although the Awarding Authority may require that such Contract adjustments be processed on standard Change Order and equitable adjustment forms.

D. For DCAMM Projects, refer to Appendix C (Commonly Used Forms) to these General Conditions for instructions regarding Change Orders, Contract Modifications, and equitable adjustments (DCAMM Form 13), form for request for Approval of wages and rates for Change Order pricing (DCAMM Form 14) and format for submission of Change Order (DCAMM Form 15). Section 2 (Directions for Computing Costs for Changes in the Work) of DCAMM Form 13 contains specific information for computing the cost of changes. DCAMM Form 14 and DCAMM Form 15 are available electronically and will be provided to the Contractor prior to the start of construction. The Contractor, all Subcontractors, and sub-Subcontractors shall utilize DCAMM Form 15 when submitting Change Order Requests.

3. <u>Work Performed under Protest.</u>

The Contractor agrees to perform all Work as directed by the Awarding Authority, and if the Awarding Authority determines that certain Work that the Contractor believes to be or to warrant a Change Order under this Article does not represent a change in the Work, the Contractor shall perform said Work. The Contractor shall be deemed to have concurred with the Awarding Authority 's determination as aforesaid unless the Contractor shall perform Work under protest in compliance with the following sub-paragraphs (1) and (2) below. Any disputed order, decision or action by the Awarding Authority or its authorized representative shall be fully performed or complied with pending resolution of the dispute.

(1) If the Contractor claims compensation for a change in the Work that is not deemed by the Awarding Authority to be a change or to warrant additional compensation as claimed by the Contractor, the Contractor shall on or before the first working day following the commencement of any such Work or the sustaining of any such damage submit to the Awarding Authority a written statement of the nature of such Work or

claim. The Contractor shall not be entitled to additional compensation for any Work performed or damage sustained for which written notice is not given within the time limit specified in the preceding sentence, even though similar in character to work or damage with respect to which notice is timely given.

(2) On or before the second working day after the commencement of such Work or the sustaining of such damage, for each day upon which work occurs or damage is sustained, the Contractor shall file to the extent possible with the Resident Engineer, the Designer, and the Awarding Authority, itemized statements of the details and costs of such Work performed or damage sustained. Unless otherwise indicated by the Awarding Authority in writing, the Contractor shall use the Awarding Authority's "Daily Time and Materials Report" form found in Appendix C to these General Conditions to record all labor and material used. If the Contractor shall fail to make such statements, then the Contractor shall not be entitled to additional compensation for any such work or damages.

4. <u>False Claims, Statutory Provisions Regarding Changes.</u>

A. Criminal Penalties. The Contractor's attention is directed to M.G.L. c. 30, § 39I which provides criminal penalties for unauthorized deviations from the Drawings and Specifications, and to M.G.L. c. 30, § 39J and M.G.L. c. 7C, §§ 17-21. The Contractor's attention is also directed to M.G.L. c. 266, § 67B which provides criminal penalties for false claims by Contractor under this Contract:

"Whoever makes or presents to any employee, department, agency or public instrumentality of the commonwealth, or of any political subdivision thereof, any claim upon or against any department, agency, or public instrumentality of the commonwealth, or any political subdivision thereof, knowing such claim to be false, fictitious, or fraudulent, shall be punished by a fine of not more than ten thousand dollars or by imprisonment in the state prison for not more than five years, or in the house of correction for not more than two and one-half years, or both."

B. Differing Site Conditions (M.G.L. c. 30, § 39N).

"If, during the progress of the work, the contractor or the Awarding Authority discovers that the actual subsurface or latent physical conditions encountered at the Site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly."

C. Timely Decision By the Awarding Authority (M.G.L. c. 30, § 39P).

"Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty day period and the date by which the decision will be made."

D. Change Order / Contract Interpretation Appeal Procedure (M.G.L. c. 30, § 39Q).

The following provisions apply to every contract awarded by any state agency as defined by M.G.L. c. 7C, § 1 for the construction, reconstruction, alteration, remodeling, repair or demolition of any capital facility as defined by the aforesaid section 39A:

"(a) Disputes regarding changes in and interpretations of the terms or scope of the contract and denials of or failures to act upon claims for payment for extra work or materials shall be resolved according to the following procedures, which shall constitute the exclusive method for resolving such disputes. Written notice of the matter in dispute shall be submitted promptly by the claimant to the chief executive official of the state agency which awarded the contract or his designee. No person or business entity having a contract with a state agency shall delay, suspend, or curtail performance under that contract as a result of any dispute subject to this section. Any disputed order, decision or action by the agency or its authorized representative shall be fully performed or complied with pending resolution of the dispute.

"(b) Within thirty days of submission of the dispute to the chief executive official of the state agency or his designee, he shall issue a written decision stating the reasons therefore, and shall notify the parties of their right of appeal under this section. If the official or his designee is unable to issue a decision within thirty days, he shall notify the parties to the dispute in writing of the reasons why a decision cannot be issued within thirty days and of the date by which the decision shall issue. Failure to issue a decision within the thirty-day period or within the additional time period specified in such written notice shall be deemed to constitute a denial of the claim and shall authorize resort to the appeal procedure described below. The decision of the chief executive official or his/her designee shall be final and conclusive unless an appeal is taken as provided below.

"(c) Within twenty-one calendar days of the receipt of a written decision or of the failure to issue a decision as stated in the preceding subparagraph, any aggrieved party may file a notice of claim for an adjudicatory hearing with the division of hearing officers or the aggrieved party may file an action directly in a court of competent jurisdiction and shall serve copies thereof upon all other parties in the form and manner prescribed by the rules governing the conduct of adjudicatory proceedings of the division of hearing officers. In the event an aggrieved party exercises his option to file an action directly in court as provided in the previous sentence, the twenty-one day period shall not apply to such filing and the period of filing such action shall be the same period otherwise applicable for filing a civil action in superior court. The appeal shall be referred to a hearing officer experienced in construction law and shall be prosecuted in accordance with the formal rules of procedure for the conduct of adjudicatory hearings of the division of hearing officers, except as provided below. The hearing officer shall issue a final decision as expeditiously as possible, but in no event more than one hundred and

twenty calendar days after conclusion of the adjudicatory hearing, unless the decision is delayed by a request for extension of time for filing post-hearing briefs or other submissions assented to by all parties. Whenever, because an extension of time has been granted, the hearing officer is unable to issue a decision within one hundred and twenty days, s/he shall notify all parties of the reasons for the delay and the date when the decision will issue. Failure to issue a decision within the one hundred and twenty-day period or within the additional period specified in such written notice shall give the petitioner the right to pursue any legal remedies available to him without further delay.

"(d) When the amount in dispute is less than ten thousand dollars, a contractor who is party to the dispute may elect to submit the appeal to a hearing officer experienced in construction law for expedited hearing in accordance with the informal rules of practice and procedure of the division of hearing officers. An expedited hearing under this subparagraph shall be available at the sole option of the contractor. The hearing officer shall issue a decision no later than sixty days following the conclusion of any hearing conducted pursuant to this subparagraph. The hearing officer's decision shall be final and conclusive, and shall not be set aside except in cases of fraud."

5. Mandatory Mediation.

In the case of every dispute where the dollar amount in dispute (or the estimated dollar value of the extension of time in dispute) is $50,000 or more and the Contractor appeals the decision of the chief executive official of the Awarding Authority or his/her designee as required by M.G.L. c.30, § 39Q, quoted in Article VII.4.D.(b) above, the Awarding Authority and the Contractor shall engage in good faith in a non-binding mediation process, which process shall be concluded within sixty days from the date that the Contractor files an appeal from said decision as provided in M.G.L. c.30, § 39Q. In the case of such disputes where the dollar amount in dispute (or the estimated dollar value of the extension of time in dispute) is $500,000 or more, if the mediation process fails, the Awarding Authority may, in its sole discretion, elect to submit the dispute to an impartial third party, not having an interest in the Owner, the Designer, the Program Manager, the Contractor, or the Project, which shall within sixty (60) days render a non-binding advisory opinion. Unless the parties have previously agreed in writing to a process for submitting disputes to mediation, the Awarding Authority shall determine in its reasonable discretion the procedures to be followed and shall give the Contractor notice of the same in writing within seven (7) days of the date that the Awarding Authority receives notice of the Contractor's appeal from the decision of the chief executive officer of the Awarding Authority or his designee. The cost of the services of any mediator selected by one party to this Contract shall be borne by the party making the selection. The cost of the services of any mediator selected jointly by the parties to this Contract or jointly by mediators selected by the parties to this Contract shall be borne equally by the Contractor and the Awarding Authority.

ARTICLE VIII
PAYMENT PROVISIONS

1. Schedule of Values.

Before the first application for payment the Contractor shall submit to the Designer and the Awarding Authority for its Approval, a schedule of values in a form acceptable to the Awarding Authority and allocated to various portions of the Work in sufficient detail to reflect the various major components of each trade (with filed Subcontractors as well as MBE/WBE

noted), including quantities when requested, aggregating the total Contract Price and divided so as to facilitate payments for work under each section of the Specifications. The schedule shall be prepared in such form and supported by such data to substantiate its accuracy as the Awarding Authority may require. Each item in the schedule shall include its proper share of overhead and profit. When Approved by the Awarding Authority, it shall constitute the Schedule of Values and shall be used only as a basis for the Contractor's requests for payments and credits, the first of which payments shall not be made until such Schedule of Values is Approved by the Awarding Authority.

2. Payment Liabilities of Contractor.

A. The Contractor shall pay to the Owner all expenses, losses and damages, as determined by the Awarding Authority or the Designer, incurred in consequence of any default, defect, omission or mistake of the Contractor or the Contractor's employees or Subcontractors or the making good thereof.

B. If the Work (or a portion thereof) is not completed to Substantial Completion and the Contractor has not satisfied the requirements for the issuance of a Certificate of Substantial Completion in accordance with Article VI.5 of these General Conditions, by the date specified in Article 2 of the Contract, the Contractor shall pay to the Owner liquidated damages as provided in Article VI.2 of these General Conditions.

3. Retention of Moneys by Awarding Authority.

A. The Awarding Authority may keep any moneys which would otherwise be payable at any time hereunder and apply the same, or so much as may be necessary therefor, to (1) the Owner 's expenditures for the Contractor's account, (2) to secure the Awarding Authority's remedies against the Contractor for the Contractor's breach of its obligations under this Contract or the breach of any person performing any part of the Work and (3) the payment of any expenses, losses or damages incurred by the Awarding Authority or any agency of the Commonwealth as a result of the failure of the Contractor to perform its obligations hereunder. The Awarding Authority may retain, until all claims are settled, such moneys as the Awarding Authority estimates to be the fair value of the Awarding Authority's claims against the Contractor, and of all claims for labor performed or furnished and for materials used or employed in or in connection with the Work and for the rental of vehicles, appliances and equipment employed and for the employment of substitute contractors and labor in connection with the Work filed in accordance with M.G.L. c. 30, § 39A and § 39F. The Awarding Authority may make such settlements and apply thereto any moneys retained under this Contract.

B. The Contractor shall each week examine all claims so filed, and if the same are in any respect incorrect or do not correctly show the amount due from the Contractor to the claimant for such labor and materials, the Contractor shall forthwith file with the Awarding Authority a separate written statement of all inaccuracies in each claim and of the correct amount due from the Contractor to each claimant therefor, and shall immediately file a statement of all payments thereafter made to such claimants. Each such statement shall be sworn to and contain a detailed breakdown required by M.G.L. c. 30, § 39F (d) and (e). Unless such statements are so filed by the Contractor the amount shown by the claims filed shall, at the option of the Awarding Authority, be conclusively deemed to be the accurate amount due from the Contractor therefor in all accounting with the Awarding Authority. If the moneys retained under this Contract are insufficient to pay

the sums found by the Awarding Authority to be due under the claims for labor and materials filed as aforesaid, the Awarding Authority may, at its discretion, pay the same, and the Contractor shall repay to the Awarding Authority all sums paid out. The Awarding Authority may also at its discretion use any moneys retained, due or to become due under this Contract for the purpose of paying for both labor and materials used or employed in the Work for which claims have not been filed with the Awarding Authority.

C. No moneys retained under the provisions of this Article shall be held to be statutory security for the payment of claims filed in accordance with the provisions of M.G.L. c. 149, § 29, as amended, for which security is provided by bond.

4. Applications for Payment.

A. The Contractor shall, once in each month on the day of the month corresponding to the day of the month specified in the Notice to Proceed, unless otherwise directed by the Awarding Authority in writing, on forms provided and in the manner prescribed by the Awarding Authority, submit to the Awarding Authority a statement showing the total amount of Work done to the time of such estimate and the value thereof as approved by the Resident Engineer and the Designer. It shall be the sole responsibility of the Contractor to deliver or cause to be delivered to the "designee" as provided by M.G.L. c. 30, § 39K indicated by the Awarding Authority in writing, said periodic estimate in proper form, approved as provided above and arithmetically correct. For DCAMM projects, the “designee” as provided by M.G.L. c. 30, § 39K shall be the DCAMM Office of Finance Payment Unit, and requests for payment shall be submitted thereto in accordance with the “DCAMM Instructions and Procedures for Payment for Construction Contracts” included in Appendix C to these General Conditions. For other projects, unless otherwise indicated by the Awarding Authority in writing, said “designee” shall be the Resident Engineer, or, if there is no Resident Engineer, the Designer; if there is neither a Resident Engineer nor a Designer the designee shall be a person designated by the Awarding Authority at the project field office or alternatively the home office of the Awarding Authority. All periodic estimates shall contain such certifications and other evidence supporting the Contractor's right to payment as the Awarding Authority may require, including without limitation, lien waivers and other evidence, on such forms as the Awarding Authority may require, establishing that title to the equipment or materials is unencumbered and has been transferred to the Owner.. The Contractor shall include in such periodic estimate only such materials as are incorporated in the Work, except as provided in Article VIII.4.C below. The Awarding Authority shall retain five (5) percent of such estimated value as security for the completion of the Work and while the Contractor continues to carry on the Work, will pay to the Contractor the Approved balance, net of the five (5) percent, all previous payments, and all sums which may be otherwise retained under the provisions of this Contract.

B. Each periodic estimate shall constitute the Contractor's representation that:

(1) the payment then requested to be disbursed has been incurred by the Contractor on account of the Work and is justly due to Subcontractors or, to the Contractor in the case of other Work performed by the Contractor on account thereof (if the Contractor’s self-performance has been previously Approved in accordance with the Contract);

(2) the materials, supplies and equipment for which application for payment is being submitted have been installed or incorporated into the Work or have been stored at the

Site or at such off Site storage locations as the Awarding Authority shall have Approved;

(3) the materials, supplies and equipment are insured in accordance with the provisions of this Contract;

(4) the materials, supplies and equipment are owned by the Owner and are not subject to any liens or encumbrances;

(5) the Work which is the subject of such periodic estimate has been performed in accordance with the Contract Documents; and

(6) that all due and payable bills with respect to the Work have been paid to date or shall be paid from the proceeds of such periodic estimate.

The Contractor's attention is directed to the criminal penalties for false claims referenced in Article VII above.

C. The Contractor may include in a periodic estimate the value of materials or equipment delivered at the Site (or at some location agreed to in writing by the Awarding Authority) only upon delivery to the Awarding Authority of:

(1) an acceptable transfer of title on the form provided by the Awarding Authority;

(2) written certification by the Contractor (or applicable Subcontractor) on the form provided by the Awarding Authority that the Contractor (or the Subcontractor which executed the transfer of title) is the lawful owner and that the materials or equipment are free from all encumbrances, accompanied by receipted invoices or other acceptable proof of prior payment for such materials;

(3) a stored materials insurance binder that covers the materials for which payment is requested, that names the Owner as an insured party should the stored materials be subjected to any casualty, loss, or theft prior to their inclusion in the Work. The material(s) or equipment must, in the judgment of the Designer, (a) meet the requirements of the Contract, including prior Shop Drawing, Product Data, and Sample Approval, (b) be ready for use, and (c) be properly stored by the Contractor and be adequately protected until incorporated into the Work. See also Article V.5.D of these General Conditions concerning the cost of inspections.

D. The Awarding Authority may make changes in any periodic estimate submitted by the Contractor in accordance with M.G.L. c.30, §39K (see below) and the payment due shall be computed in accordance with the changes so made. The provisions of said section 39K shall govern payments on which the Awarding Authority has made changes.

E. No certificate for payment and no progress payment shall constitute acceptance of Work that is not in accordance with the Contract Documents.

5. Periodic Payments (M.G. L. c. 30, § 39K).

The Awarding Authority shall make payment to the Contractor in accordance with M.G.L. c. 30, § 39K, which provides as follows (for the purposes of the below language, the Awarding Authority shall be considered the “awarding authority”, the Designer shall be considered the “architect” or “engineer”, the Contractor shall be considered the “contractor” and Subcontractors shall be considered “subcontractors”):

"Within fifteen days (30 days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding

authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five percent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one percent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days(twenty-four days in the case of the commonwealth) after receipt of such period estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

The awarding authority may make changes in any periodic estimate submitted by the contractor and the payment due on said periodic estimate shall be computed in accordance with the change so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the awarding authority may, within seven days after receipt, return to the contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically correct and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty-nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this section applies.

All periodic estimates shall be submitted to the awarding authority, or to its designee as set forth in writing to the contractor, and the date of receipt by the awarding authority or its

designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed subtrade and each sub-subtrade listed in sub-bid form as required by specifications and column listing the amount paid to each filed subcontractor as of the date of the periodic estimate is filed. The person making payment for the awarding authority shall add the daily interest provided for herein to each payment for each day beyond the due date of receipt marked on the estimate.

A certificate of the architect to the effect that the contractor has fully or substantially completed the work shall, subject to the provisions of section thirty-nine J, be conclusive for the purposes of this section.

Notwithstanding the provisions of this section, at any time after the value of the work remaining to be done is, in the estimation of the awarding authority, less than 1 per cent of the adjusted contract price, or the awarding authority has determined that the contractor has substantially completed the work and the awarding authority has taken possession for occupancy, the awarding authority may send to the general contractor by certified mail, return receipt requested, a complete and final list of all incomplete and unsatisfactory work items, including, for each item on the list, a good faith estimate of the fair and reasonable cost of completing such item. The general contractor shall then complete all such work items within 30 days of receipt of such list or before the contract completion date, whichever is later. If the general contractor fails to complete all incomplete and unsatisfactory work items within 45 days after receipt of such items furnished by the awarding authority or before the contract completion date, whichever is later, subsequent to an additional 14 days' written notice to the general contractor by certified mail, return receipt requested, the awarding authority may terminate the contract and complete the incomplete and unsatisfactory work items and charge the cost of same to the general contractor and such termination shall be without prejudice to any other rights or remedies the awarding authority may have under the contract. The awarding authority shall note any such termination in the evaluation form to be filed by the awarding authority pursuant to the provisions of section 44D of chapter 149."

6. Payment of Subcontractors (M.G.L. c. 30, § 39F).

The Contractor shall make payments to Subcontractors in accordance with M.G.L c.30, § 39F which is quoted in this section below. For the purposes of this Contract, the word "forthwith" appearing in paragraph (1)(a) of the quoted provision shall be deemed to mean "within five (5) business days."

"1(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (1) and (2) the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deduction from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (5) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account,

including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest bearing account or accounts in a bank pursuant to subparagraph (6) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest bearing accounts pursuant to subparagraph (6) are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

(i) If the subcontractor does not receive payment as provided in subparagraph (1) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (1), the subcontractor may demand direct payment by following the procedure in subparagraph (4) and the general contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g) and (h)."

(2) Any assignment by a subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty-nine of chapter one hundred forty-nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the awarding authority or which are on deposit pursuant to subparagraph (6) shall be subordinate to the rights of all subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "subcontractor" as used in this section (I) for contracts awarded as provided in sections forty-four A to forty-four L, inclusive, of chapter one hundred forty-nine shall mean a person who files a sub-bid and received a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (ii) for contracts awarded as provided in paragraph (1) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, and (iii) for contracts with the commonwealth not awarded as provided in sections forty-four A to forty-four L, inclusive, of chapter one hundred forty-nine shall also mean a person contracting with the general contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars.

(4) A general contractor or a subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposit as provided in subparagraph (6) by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (6) by a petition in equity in the superior court against the awarding authority and the general contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty-nine and fifty-nine B of chapter two hundred thirty-one shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty-nine and fifty-nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any subcontractor with the petition of one or more subcontractors or the same general Contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a subcontractor filing a demand for direct payment for which no funds due the general contractor are available for direct payment shall have a right to file a petition in court of equity against the awarding authority claiming a demand for direct payment is premature and such subcontractor must file the petition before the awarding authority has made a direct payment to the subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (5) and in subparagraph (6).

(5) In any petition to collect any claim for which a subcontractor has filed a demand for direct payment the court shall, upon motion of the general contractor, reduce by the amount of any deposit of a disputed amount by the awarding authority as provided in part (iii) of subparagraph (5) and in subparagraph (6) any amount held under a trustee writ or pursuant to a restraining order or injunction."

7. Contracts for Public Works Governed by M.G.L. c. 30, § 39G.

The following statutory provision applies only to contracts for public works governed by M.G.L. c. 30, § 39G:

"Upon substantial completion of the work required by a Contract with the Owner, or any agency or political subdivision thereof, for the construction, reconstruction, alteration, remodeling, repair or improvement of public ways, including bridges, and other highway structures, sewers and water mains, airports and other public works, the contractor shall present in writing to the awarding authority its certification that the work has been substantially completed. Within twenty-one days thereafter, the awarding authority shall present to the contractor either a written declaration that the work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the contract sufficient to demonstrate that the work has not been substantially completed. The awarding authority may include with such a list a notice setting forth a reasonable time, which shall not in any event be prior to the contract completion date, within which the contractor must achieve substantial completion of the work. In the event that the awarding authority fails to respond, by presentation of a written declaration or itemized list as

aforesaid, to the contractor's certification within the twenty-one day period, the contractor's certification shall take effect as the awarding authority's declaration that the work has been substantially completed.

Within sixty-five days after the effective date of a declaration of a substantial completion, the awarding authority shall prepare and forthwith send to the contractor for acceptance a substantial completion estimate for the quantity and price of the work done and all but one percent retainage of that undisputed part of each work item and extra work item in dispute but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory work items and less the total periodic payments made to date for the work. The awarding authority also shall deduct from the substantial completion estimate an amount equal to the sum of all demands for direct payments filed by subcontractors and not yet paid to subcontractors or deposit d in joint accounts pursuant to section thirty-nine F, but no Contract subject to said section thirty-nine F shall contain any other provision authorizing the awarding authority to deduct any amount by virtue of claims asserted against the contract by subcontractors, material suppliers or others.

If the awarding authority fails to prepare and send to the contractor any substantial completion estimate required by this section on or before the date herein above set forth, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such substantial completion estimate at the rate of three percentage points above the rediscount rate than charged by the Federal Reserve Bank of Boston from such date to the date on which the awarding authority sends that substantial completion estimate to the contractor for acceptance or to the date of payment therefor, whichever occurs first. The awarding authority shall include the amount of such interest in the substantial completion estimate.

Within fifteen days after the effective date of the declaration of substantial completion, the awarding authority shall send to the contractor by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory work items, and, unless delayed by causes beyond his control, the contractor shall complete all such work items within forty-five days after the receipt of such list or before the then contract completion date, whichever is later. If the contractor fails to complete such work within such time, the awarding authority may, subsequent to seven days' written notice to the contractor by certified mail, return receipt requested, terminate the contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the contractor.

Within thirty days after receipt by the awarding authority of a notice from the contractor stating that all of the work required by the contract has been completed, the awarding authority shall prepare and forthwith send to the contractor for acceptance a final estimate for the quantity and price of the work done and all retainage on that work less all payments made to date, unless the awarding authority's inspection shows that work items required by the contract remain incomplete or unsatisfactory, or that documentation required by the contract has not been completed. If the awarding authority fails to prepare and send to the contractor the final estimate within thirty days after receipt of notice of completion, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such final estimate at the rate hereinabove provided from the thirtieth day after such completion until the date on which the awarding authority sends the final estimate to the contractor for acceptance or the date or payment therefore, whichever occurs first, provided that the awarding authority's inspection shows that no work items required by the contract remain incomplete or unsatisfactory. Interest shall not be paid

hereunder on amounts for which interest is required to be paid in connection with the substantial completion estimate as hereinabove provided. The awarding authority shall include the amount of the interest required to be paid hereunder in the final estimate.

The awarding authority shall pay the amount due pursuant to any substantial completion or final estimate within thirty-five days after receipt of written acceptance for such estimate from the contractor and shall pay interest on the amount due pursuant to such estimate at the rate hereinabove provided from that thirty-fifth day to the date of payment. Within 15 days, 30 days in the case of the commonwealth, after receipt from the contractor, at the place designated by the awarding authority, if such place is designated, of a periodic estimate requesting payment of the amount due for the preceding periodic estimate period, the awarding authority shall make a periodic payment to the contractor for the work performed during the preceding periodic estimate period and for the materials not incorporated in the work but delivered and suitably stored at the Site, or at some location agreed upon in writing, to which the contractor has title or to which a subcontractor has title and authorized the contractor to transfer title to the awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances. The awarding authority shall include with each such payment interest on the amount due pursuant to such periodic estimate at the rate herein above provided from the due date. In the case of periodic payments, the contracting authority may deduct from its payment a retention based on the estimate of the fair value of its claims against the contractor, a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and a retention to secure satisfactory performance of the contractual work not exceeding five per cent of the approved amount of any periodic payment, and the same right to retention shall apply to bonded subcontractors entitled to direct payment under section thirty-nine F of chapter thirty; provided that a five per cent value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

No periodic, substantial completion or final estimate or acceptance or payment thereof shall bar a contractor from reserving all rights to dispute the quantity and amount of, or the failure of the awarding authority to approve a quantity and amount of, all or part of any work item or extra work item.

Substantial completion, for the purposes of this section, shall mean either that the work required by the contract has been completed except for work having a contract price of less than one percent of the then adjusted total contract price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the contract"

8. Final Payment; Release of Claims by Contractor.

Upon Final Acceptance of the Work the Contractor shall be entitled to payment of the balance of the Contract Price. Final payment shall be as provided in this Article above and in accordance with any process set forth in the Contract Documents. The Contractor agrees to execute a Certificate of Final Inspection, Release and Acceptance in the form provided in Appendix C to these General Conditions to the Contract (with Contractor's own exceptions listed thereon) as a condition precedent to final payment. The acceptance by the Contractor of the final payment made as aforesaid, or the execution of the "Certificate of Final Inspection, Release and Acceptance" (included in Appendix C to these General Conditions) by the Contractor, shall constitute a release of the Owner, the Awarding Authority, the Designer, and every member, officer, employee and agent of any of them, from all claims of

and liability to the Contractor for anything done or furnished for or relating to the Work, or for any act or neglect of the Owner, the Designer, or of any person relating to or affecting the Work, except the claim against the Owner or the Designer for the remainder, if any, of the amounts set forth by the Contractor in the "Certificate of Final Inspection, Release and Acceptance". Final Acceptance shall not relieve Contractor of the requirements of Articles IX, XIV, and XV of these General Conditions, or of other provisions of this Contract, to the extent that the same are intended to survive Final Acceptance.

ARTICLE IX
GUARANTEES AND WARRANTIES

1. General Warranty.

If at any time during the period of one (1) year from the date of the issuance of the Certificate of Substantial Completion by the Awarding Authority or the date of Final Acceptance, whichever occurs first, any part of such Work shall in the reasonable opinion of the Awarding Authority be defective or require replacing or repairing, or damage to other property of the Owner is caused by any defect in the Work, the Awarding Authority shall notify the Contractor in writing to make the required repairs or replacements and repair such damage. If the Contractor shall neglect to commence such repairs or replacements to the satisfaction to the Awarding Authority within ten (10) days from the date of the giving of such notice, then the Awarding Authority may employ other persons to make the same. The Contractor agrees, upon demand, to pay to the Awarding Authority all amounts which it expends for such repairs, replacements, and/or damages. During this one-year guarantee period, any corrective work shall be performed under all the applicable terms of this Contract,. This one-year guarantee shall not limit any express guaranty or warranty provided elsewhere in the Contract.

2. Special Guarantees and Warrantees.

A. The Contractor's obligation to correct Work as set forth in Article IX above is in addition to, and not in substitution of, such guarantees or warranties as may be required in the various sections of the Specifications.

B. Guarantees and warranties required in the various sections of the Specifications must be delivered to the Designer or, if directed by the Awarding Authority, to the Awarding Authority before final payment to the Contractor may be made, or in the case of guarantees and warranties which originate with a Subcontractor's section of the Work, before final payment for the amount of that subtrade or for the phase of Work to which the guarantee or warranty relates.

C. The failure to deliver a required guarantee or warranty shall constitute a failure to fully complete the Work in accordance with the Contract Documents.

ARTICLE X
MISCELLANEOUS LEGAL REQUIREMENTS.

1. Contractor to be Informed.

The Contractor shall inform itself of all existing and future Laws in any manner affecting those engaged or employed in the Work, or the materials used or employed in the Work, or in a any way affecting the conduct of the Work, and of all orders and decrees of bodies or tribunals having any applicable jurisdiction or authority over the Work.

2. Compliance with all Laws.

The Contractor shall cause all persons employed in the performance of the Work to comply with, all existing and future Laws, including but not limited to those set forth below:

A. Corporate Disclosures. The Contractor, if a foreign corporation, shall comply with M.G.L. c. 181, § 3 and § 5, and M.G.L. c. 30, § 39L.

B. Workforce Certification: Certification of Compliance with Workforce Related Legal Requirements. The Contractor shall comply with the following legal requirements for any and all employees to be employed in the Project who are required to be listed in the certified payroll reports for the Project:1) Federal Department of Homeland Security Requirements in hiring such employees including, but not limited to, the faithful completion of the Federal Department of Homeland Security Form I-9 process by the Contractor; 2) proper classification of individuals employed on the Project; 3) all Laws concerning workers' compensation insurance coverage, unemployment insurance, social security taxes, and income taxes; and 4) all Laws concerning hospitalization and medical benefits that meet the minimum requirements of the connector board established in M.G.L. c. 176Q. The Contractor shall execute a "Workforce Certification" form provided in Exhibit B to the Contract with the execution of this Contract. The Contractor shall require each Subcontractor and sub-Subcontractor working on the Project to execute and provide to Contractor such "Workforce Certification" form in the form provided in Exhibit B to the Contract with the execution of each subcontract, and Contractor shall immediately provide a copy to the Awarding Authority. The Contractor shall require each of its Subcontractors and sub-Subcontractors to execute and provide to Contractor such "Workforce Certification" form in the form provided in Exhibit B to the Contract with the execution of each subcontract, and the Contractor shall immediately provide a copy to the Awarding Authority. Contractor acknowledges that with the weekly workforce reports it must submit on a weekly basis, in the form and format required by the Awarding Authority, including, but not limited to, by electronic reporting through the requested means. Contractor and all Subcontractors must also report on gender, race/ethnicity of its workforce through the requested means, including the Awarding Authority's online workforce reporting system. Contractor and all Subcontractors on the Project are required to certify that the Form I-9 process was faithfully completed and that all other legal requirements related to its workforce referenced above were followed for all employees listed on each certified payroll report when submitted. The Contractor and all Subcontractors must: comply with the legal requirements of this section; must not knowingly use undocumented workers in connection with the performance of this Contract; pursuant to federal requirements must verify the immigration status of all workers assigned to the Contract without engaging in unlawful discrimination; and must not knowingly or recklessly alter, falsify, or accept altered or falsified documents from any such worker. Breach of any of the terms of the workforce certification legal requirements during the period of the Contract may be regarded as a material breach,

subjecting the Contractor and Subcontractors to sanctions, including but not limited to monetary penalties, withholding of payments, contract suspension or termination.

C. Veterans and Other Preference. In the employment of mechanics and apprentices, teamsters, chauffeurs, and laborers in the performance of Work in the Commonwealth, preference shall first be given to citizens of the Commonwealth who have been residents of the Commonwealth for at least six (6) months at the commencement of their employment and who are veterans as defined in M.G.L. c. 4,§ 7(34), and who are qualified to perform the work to which the employment relates and, within such preference, preference shall be given to service-disabled veterans; and secondly, to citizens of the Commonwealth generally who have been residents of the Commonwealth for at least six (6) months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States.

The Awarding Authority encourages and monitors the participation of veteran business enterprises ("VBE") and service-disabled veteran-owned business enterprises ("SDVOBE") in its construction and design projects pursuant to Chapter 108 of the Acts of 2012 and Executive Order 565. The benchmark for combined SDVOBE and VBE participation on the Project is 3% of the Contract Price. For the Commonwealth's VBE and SDVOBE program purposes, a VBE or SDVOBE is a firm so certified directly by the Massachusetts Supplier Diversity Office ("SDO") www.mass.gov/sdo or is: 1) certified by a certifying agency that's certification is accepted by the SDO; 2) the firm has submitted its existing certification credentials directly to the SDO by submitting an application for verification of certification to the SDO; 3) the SDO has reviewed and granted the application for verification; and 4) the SDO has certified the firm as a VBE or SDVOBE for purposes of the Commonwealth's program as evidenced by a letter issued by the SDO to the firm. VBEs and SDVOBEs shall be provided opportunities to participate in the Project and Contractor shall within 30 days of Contract execution submit its "Anticipated Veteran Owned Business and Service-Disabled Veteran-Owned Business Enterprise Participation" plan to the Awarding Authority's Compliance Office. Contractor shall report on the amount of VBE and SDVOBE participation on the Project on a regular basis, in the form, format and frequency requested by the Awarding Authority, including, for DCAMM projects, through the requested means including the Awarding Authority's online compliance reporting system. The Commonwealth also encourages the participation of Portuguese Business Enterprises (PBE), Lesbian, Gay, Bisexual, and Transgender Business Enterprises (LGBTBE); and Disability-Owned Business Enterprises (DOBE) on its contracts.

D. Prevailing Wages. The Contractor shall comply with M.G.L. c. 149, §§ 26-27H. The prevailing wage schedule is found in Exhibit A to the "Instructions to Bidders" included in the public solicitation of bids for this Project, listing the prevailing minimum wage rates that must be paid to all workers employed in the Work. The Awarding Authority is not responsible for any errors, omissions, or misprints in said schedule. Such prevailing wage schedule shall continue to be the minimum rate wages payable to workers employed in the Work throughout the term of this Contract, subject to the exceptions provided in M.G.L c.149, §§ 26-27H. The Contractor shall not have any claim for extra compensation from the Owner if the actual wages paid to workers employed in the Work exceeds the rates listed on the schedule or as otherwise provided by Law. The Contractor shall cause a copy of said schedule to be kept in a conspicuous place at the Site during the term of the Contract. If reserve police officers are employed by the Contractor, they shall be paid the prevailing wage of regular police officers. (See M.G.L c.149, § 34B). In accordance with M. G. L. c. 149, §27the Contractor shall obtain from the Awarding Authority annual updates to prevailing wage schedules for all public construction projects lasting longer than one year. The Contractor is required to obtain the

wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The Contractor and all Subcontractors are required to anticipate such annual updated prevailing wage schedules and neither the Contractor nor any Subcontractors shall be entitled to claim additional compensation for base contract work due to updated prevailing wage schedules.

E. Payroll Records and Statement of Compliance. The Contractor shall comply and shall cause its Subcontractors to comply with M.G.L. c. 149, § 27B, which requires that a true and accurate record be kept of all persons employed on the Project for which the prevailing wage rates have been provided. The Contractor and all Subcontractors shall keep these records and preserve them for a period of three years from the date of completion of the Contract. Such records shall be open to inspection by any authorized representative of the Owner at any reasonable time, and as often as may be necessary. The Contractor shall, and shall cause its Subcontractors to, submit weekly certified copies of their weekly payroll records to the Awarding Authority at no additional expense to the Awarding Authority. The Awarding Authority may at all reasonable times audit such reports. DCAMM requires submission of weekly payroll reports and related information through DCAMM's online compliance reporting system. In addition, the Contractor and each Subcontractor shall furnish to the Executive Department of Labor within fifteen (15) days after completion of its portion of the Work a signed statement in the form required by the Awarding Authority.

F. Vehicle operators. If the Director of the Department of Labor and Workforce Development has established a schedule of wage rates to be paid to the operators of trucks, vehicles or equipment for the Work, the Contractor shall be obligated to pay such operators at least the minimum wage rate contained on such schedule. (See M.G.L. c.149, §§ 26-27H).

G. Eight Hour Day. The Contractor shall comply with M.G.L. c. 149, §§ 30, 34 and 34A which provide that no laborer, workman, mechanic, foreman or inspector working within the Commonwealth in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or part of the Work shall be required or permitted to work more than eight (8) hours in any one day or more than forty-eight (48) hours in any one week, or more than six (6) days in any one week, except in cases of extraordinary emergency.

H. Timely Payment of Wages. The Contractor shall comply with, and shall cause its Subcontractors to comply with M.G.L. c. 149, § 148 which requires the weekly or biweekly payment of employees within six (6) days of the end of the pay period during which wages were earned if employed for five or six days of a calendar week, and within other periods of time under certain circumstances as set forth therein.

I. Lodging, etc. The Contractor shall comply with, and shall cause its Subcontractors to comply with, M.G.L. c. 149, § 25 which provides that every employee under this Contract shall lodge, board and trade where and with whom he elects, and neither the Contractor nor his agents or employees shall, either directly or indirectly, require as a condition of the employment of any person that the employee shall lodge, board or trade at a particular place or with a particular person.

J. Truck Rates. The use by the Contractor of trucks or other motor vehicles hired from either common or contract motor carriers in the course of performance of this Contract is subject to such minimum rates and charges, and rules and regulations as may from time to time be promulgated by the Department of Public Utilities of the Commonwealth of Massachusetts or other agency of the State or Federal government which may be

authorized by Law to set rates or otherwise regulate the use of such vehicles. The Contractor expressly assumes the risk of any additional expense that may arise by reason of any change in such minimum rates and charges, and rules and regulations, and shall be entitled to no additional compensation or reimbursement by reason thereof.

K. Anti-Boycott Covenant (Executive Order 130). The Contractor warrants, represents and agrees that during the time this Contract is in effect, neither it or any affiliated company, as hereafter defined, participates in or cooperates with an international boycott, as defined in Section 999(b) (3) and (4) of the Internal Revenue Code of 1954, as amended, or engages in conduct declared to be unlawful by M.G.L. c. 151E, § 2. If there shall be a breach in the warranty, representation or agreement contained in this paragraph, then without limiting such other rights as it may have the Awarding Authority shall be entitled to rescind this Contract. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the Contractor or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interests of the Contractor; or which directly or indirectly owns at least 51% of the Ownership interests of the Contractor.

L. Contractor's Agreements with Suppliers--Anti-Boycott Provisions.

(1) The Contractor shall not purchase or rent any materials, equipment, machinery, vehicles, or supplies for or in connection with the Work from any person or entity who does not sign, under pains and penalties of perjury, a certificate that recites: "The undersigned warrants, represents and agrees that during the time its agreement with {insert contractor's name} is in effect for materials, supplies or equipment to be used in connection with the {insert the name of the Awarding Authority} Project No. {insert project number}, neither the undersigned or any affiliated company, as hereafter defined, participates in or cooperates with an international boycott, as defined in Section 999(b)(3) and (4) of the Internal Revenue Code of 1954, as amended, or engages in conduct declared to be unlawful by M.G.L. c.151E, § 2. As used herein, an affiliated company shall be any business entity of which at least 51% of the ownership interests are directly or indirectly owned by the undersigned or by a person or persons or business entity or entities directly or indirectly owning at least 51% of the ownership interests of the undersigned; or which directly or indirectly owns at least 51% of the ownership interests of the undersigned."

(2) The Awarding Authority shall not be obligated to pay the Contractor for the cost of any materials, supplies, or equipment purchased or rented from any individual or entity from whom the Contractor has not previously obtained and delivered to the Awarding Authority the certificate that the previous paragraph requires. The Contractor will immediately terminate its contract with any supplier who breaches the warranty, representation and agreement contained in the previous paragraph.

(3) The Contractor shall include in the Contractor's agreement with any person or entity from whom the Contractor intends to purchase or rent any materials, equipment, machinery, vehicles or supplies for or in connection with the Work: (a) a notice that this Contract obligates the Contractor to terminate the supply contract upon discovery of such breach of the sworn certificate delivered under subparagraph (1) above and such termination shall be without liability to the Contractor or the Awarding Authority; and (b) a provision which states: "The Governor or his designee, the secretary of administration and finance, and the state auditor or his designee shall have the right at reasonable times and upon reasonable notice to examine the books,

records and other compilations of the undersigned vendor which pertain to the performance and requirements of this agreement to provide materials of any nature to the undersigned contractor in connection with State Project No. (insert project number)."

M. Access to Contractor's Records (Executive Order 195). The Governor of the Commonwealth or his/her designee, the secretary of administration and finance, and the state auditor or his/her designee shall have the right at reasonable times and upon reasonable notice to examine the books, records and other compilations of data of the Contractor which pertain to the performance and requirements of this Contract.

N. Northern Ireland (M.G.L. c. 7, § 22C). Pursuant to M.G.L. c. 7, § 22C for state agencies, state authorities, the House of Representatives or the state Senate, the Contractor certifies that it does not employ ten (10) or more employees in an office or other facility in Northern Ireland and if the Contractor employs ten (10) or more employees in an office or other facility located in Northern Ireland the Contractor certifies that it does not discriminate in employment, compensation, or the terms, conditions and privileges of employment on account of religious or political belief; and it promotes religious tolerance within the work place, and the eradication of any manifestations of religious and other illegal discrimination; and the Contractor is not engaged in the manufacture, distribution or sale of firearms, munitions, including rubber or plastic bullets, tear gas, armored vehicles or military aircraft for use or deployment in any activity in Northern Ireland.

O. Data Security Certifications. For all contracts involving the Contractor's access to personal information, as defined in M.G.L. c. 93H, and personal data, as defined in M.G.L. c. 66A or access to agency systems containing such information or data, the Contractor certifies under the pains and penalties of perjury that the Contractor (a) has read M.G.L. c. 93H and c. 66A and agrees to protect any and all personal information and personal data; and (b) has reviewed all of the "Enterprise Information Security Policies and Standards" published by the Executive Office for Technology Services and Security ("TSS")), or stricter standards prescribed by Owner. Notwithstanding any contractual provision to the contrary, in connection with the Contractor's performance under this Contract, for all state agencies in the Executive Department, including all offices, boards, commissions, agencies, departments, divisions, councils, bureaus, and offices, now existing and hereafter established, the Contractor shall:

(1) obtain a copy, review, and comply with the pertinent security guidelines, standards and policies;

(2) comply with the "Enterprise Information Security Policies and Standards" published by TSS, or a comparable set of policies and standards ("Information Security Policy") as prescribed by the Owner;

(3) communicate and enforce such security guidelines, standards, policies and the applicable Information Security Policy among all employees (whether such employees are direct or contracted) and Subcontractors;

(4) implement and maintain any other reasonable appropriate security procedures and practices necessary to protect personal information and data to which the Contractor is given access by the Awarding Authority from the unauthorized access, destruction, use, modification, disclosure or loss;

(5) be responsible for the full or partial breach of any of these terms by its employees (whether such employees are direct or contracted) or Subcontractors during or after

the term of this Contract, and any breach of these terms may be regarded as a material breach of this Contract;

(6) in the event of any unauthorized access, destruction, use, modification, disclosure or loss of the personal information or personal data (collectively referred to as the "unauthorized use"): (a) immediately notify the Awarding Authority if the Contractor becomes aware of the unauthorized use; (b) provide full cooperation and access to information necessary for the Awarding Authority to determine the scope of the unauthorized use; and (c) provide full cooperation and access to information necessary for the Awarding Authority and the Contractor to fulfill any notification requirements.

Breach of these terms may be regarded as a material breach of this Contract, such that the Commonwealth may exercise any and all contractual rights and remedies, including without limitation indemnification, withholding of payments, Contract suspension, or termination. In addition, the Contractor may be subject to applicable statutory or regulatory penalties, including and without limitation, those imposed pursuant to M.G.L. c. 93H and under M.G.L. c. 214, § 3B for violations under M.G.L. c. 66A.

ARTICLE XI
CONTRACTOR'S ACCOUNTING METHOD REQUIREMENTS
(M.G.L. c. 30, § 39R)

1. Definitions.

The words defined herein shall have the meaning stated below whenever they appear in this Article XI:

"***Independent Certified Public Account***" means a person duly registered in good standing and entitled to practice as a certified public accountant under the Laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the Awarding Authority.

"***Records***" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

"***Audit***", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.

Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

2. Record Keeping.

A. The Contractor shall make, and keep for at least six (6) years after final payment, books, records, and accounts that in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor.

B. Until the expiration of six (6) years after final payment, the Inspector General, DCAMM, and the Awarding Authority shall have the right to examine any books, documents, papers or records of the Contractor and Subcontractors that directly pertain to, and involve transactions relating to the Contractor and Subcontractors.

C. The Contractor shall describe any change in the method of maintaining records or recording transactions which materially affects any statements filed with the Awarding Authority including the date of the change and reasons therefor, and shall accompany said description with a letter from the Contractor's independent certified public accountant approving or otherwise commenting on the changes.

D. The Contractor represents that it has, prior to the execution of the Contract, filed a statement of management on internal accounting controls as set forth in Article XI.3 below.

E. The Contractor represents that it has, prior to the execution of the Contract, filed an audited financial statement for the most recent completed fiscal year as set forth in Article XI.4 below and will continue to file such statement annually during the term of the Contract.

3. Statement of Management Controls.

A. The Contractor shall file with the Awarding Authority a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

(1) transactions are executed in accordance with management's general and specific authorization;

(2) transactions are recorded as necessary to: (a) to permit preparation of financial statements in conformity with generally accepted accounting principles, and (b) to maintain accountability for assets;

(3) access to assets is permitted only in accordance with management's general or specific authorization; and

(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

B. The Contractor shall file with the Awarding Authority a statement prepared and signed by an independent certified public accountant, stating that the accountant has examined the statement of management on internal accounting controls, and expressing an opinion as to:

(1) whether the representations of management in response to Article XI.3 above are consistent with the results of management's evaluation of the system of internal accounting controls; and

(2) whether such representations of management are reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statement.

4. Annual Financial Statement.

A. The Contractor shall annually file with DCAMM during the term of the Contract a financial statement prepared by an independent certified public accountant based on an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report.

B. The office of Inspector General and DCAMM shall have the right to enforce the provisions of this Article. A Contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to M.G.L. c. 149, § 44C.

5. Bid Pricing Materials.

The Contractor shall save the written calculations, pricing information, and other data that the Contractor used to calculate the bid that induced the Awarding Authority to enter into this Contract (the "Bid Pricing Materials") for at least six (6) years after the Awarding Authority makes final payment under this Contract.

ARTICLE XII
EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM.

[EXECUTIVE ORDERS 524 & 565] (See Appendix A)

This Contract includes the provisions of the Awarding Authority's "Equal Employment Opportunity, Non-Discrimination, and Affirmative Action Program" attached as Appendix A to these General Conditions and incorporated herein by reference.

ARTICLE XIII
GOALS FOR PARTICIPATION BY MINORITY BUSINESS ENTERPRISES AND WOMEN BUSINESS ENTERPRISES

[M.G.L. c. 7C, § 6 & EXECUTIVE ORDERS 524 & 565]

This Contract includes the provisions of the Awarding Authority's program relating to “Goals for Participation by Minority Business Enterprises and Women Business Enterprises” attached as Appendix B to these General Conditions and incorporated herein by reference.

ARTICLE XIV
INSURANCE REQUIREMENTS

1. Insurance Generally.

A. The Contractor shall purchase and maintain insurance of the type and limits listed in this Article with respect to the operations as well as the completed operations of this Contract. This insurance shall be provided at the Contractor's expense and shall be in full force and effect for the full term of the Contract or for such longer period as this Article requires.

B. All policies shall be written on an occurrence basis and be issued by companies lawfully authorized to write that type of insurance under the laws of the Commonwealth with a financial strength rating of “A-” or better as assigned by AM Best Company, or an equivalent rating assigned by a similar rating agency acceptable to the Awarding Authority, or otherwise acceptable to the Awarding Authority.

C. Contractor shall submit each certificate of insurance, acceptable to the Awarding Authority, simultaneously with the execution of this Contract. Certificates shall show each type of insurance, insurance company, policy number, amount of insurance, deductibles and/or

self-insured retentions, and policy effective and expiration dates. Certificates shall show the Awarding Authority, the Owner and anyone else the Awarding Authority requests as an additional insured as to all policies of liability insurance. Certificates shall specifically note the following:

(1) that the general liability policy includes contractual liability.

(2) that the general liability policy includes the Owner and Awarding Authority as additional insureds for ongoing operations (CG 20 10) and for completed operations (CG 37 10) or equivalent endorsements.

(3) that the automobile liability, umbrella liability and pollution liability policies include the Owner and Awarding Authority as an additional insured;

(4) that the general liability policy includes endorsement CG 24 04 or equivalents, a waiver of subrogation in favor of the Owner and Awarding Authority.

(5) that the builders' risk or installation floater is on an all risk basis including earthquake and flood, and includes the Awarding Authority, Owner, Contractor, Subcontractors and suppliers of any tier as a named insured or loss payee as their interests may appear; and

(6) that none of the coverages shall be cancelled, terminated, or materially modified unless and until thirty (30) days prior notice is given in writing to the Awarding Authority.

Contractor shall submit updated certificates prior to the expiration of any of the policies referenced in the certificates so that the Awarding Authority shall at all times possess certificates indicating current coverage.

D. The Contractor shall file one certified complete copy of all policies and endorsements with the Awarding Authority within sixty (60) days after Contract award. If the Awarding Authority is damaged by the Contractor's failure to maintain such insurance and to comply with the terms of this Article, then the Contractor shall be responsible for all costs and damages to the Awarding Authority attributable thereto.

E. Termination, cancellation, or material modification of any insurance required by this Contract, whether by the insurer or the insured, shall not be valid unless written notice thereof is given to the Awarding Authority at least thirty(30) days prior to the effective date thereof, which shall be expressed in said notice.

F. The Contractor is responsible for the payment of any and all deductibles under all of the insurance required below. The Awarding Authority shall not in any instance be responsible for the payment of deductibles, self-insured retentions, or any portion thereof.

2. <u>Contractor's Commercial General Liability.</u>

A. The Contractor shall purchase and maintain general liability coverage on the ISO form CG 00 01 or equivalent, including products and completed operations, on an occurrence basis. The form must be amended to state that the aggregate limit applies on a per location/project basis. The policy shall provide the following minimum coverage to protect the Contractor from claims with respect to the operations performed by Contractor and any employee, Subcontractor, or supplier, or by anyone for whose acts they may be liable unless a higher coverage is specified in Exhibit A to the Contract, in which case the Contractor shall provide the additional coverage:

Bodily Injury &	$1,000,000 each occurrence
Property Damage	$2,000,000 general aggregate per project
Products & Completed Operations	$1,000,000 annual aggregate
Personal & Advertising Injury	$1,000,000 each occurrence
Medical Expenses	$10,000

B. This policy shall include coverage relating to explosion, collapse, and underground property damage.

C. This policy shall include contractual liability coverage.

D. The completed operations coverage shall be maintained for a period of three (3) years after Substantial Completion and acceptance by the Awarding Authority. The Contractor shall provide renewal certificates of insurance to the Awarding Authority as evidence that this coverage is being maintained.

E. If the Work includes work to be performed within 50 feet of a railroad, any exclusion for liability assumed under contract for work within 50 feet of a railroad shall be deleted.

F. This policy shall include the Awarding Authority, the Owner and anyone else requested by the Awarding Authority as an additional insured via endorsements CG 20 10 for ongoing operations and CG 20 37 for completed operations This policy shall be primary and non-contributory with respect to any other insurance available to additional insureds.

G. The policy shall include endorsement CG 24 04, a waiver of subrogation in favor of the Awarding Authority and Owner.

3. <u>Automobile Liability.</u>

A. The Contractor shall purchase and maintain the following minimum coverage with respect to the operations of any owned, non-owned, and hired vehicles including trailers used in the performance of the work, unless a higher coverage is specified in Exhibit A to the Contract, in which case the Contractor shall provide the additional coverage:

Bodily Injury & Property Damage $1,000,000 combined single limit

B. The policy shall include a CA 99 48 Broadened Pollution Endorsement. If specified in Exhibit A to the Contract, the Contractor, if hauling contaminants and/or pollutants, must adhere to Sections 29 and 30 of the Motor Carrier Act of 1980, which shall include coverage Form MCS-90.

C. The policy shall name the Awarding Authority and Owner as additional insureds.

D. The policy shall contain a waiver of subrogation in favor of the Awarding Authority and Owner.

4. <u>Contractor's Pollution Liability.</u>

The Contractor shall purchase and maintain coverage for bodily injury and property damage resulting from liability arising out of pollution related exposures such as asbestos abatement, lead paint abatement, tank removal, removal of contaminated soil, etc. The insurance policy shall cover the liability of the Contractor during the process of removal, storage, transport and disposal of hazardous waste and contaminated soil and/or asbestos abatement. The policy shall include coverage for on-Site and off-Site bodily injury and loss of, damage to, or loss of use of

property, directly or indirectly arising out of the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gas, waste materials or other irritants, contaminants or pollutants into or upon the land, the atmosphere or any water course or body of water, whether it be gradual or sudden and accidental. The policy shall also include defense and clean-up costs. The Awarding Authority and Owner shall be named as an additional insureds and coverage must be on an occurrence basis. The amount of coverage shall be as follows unless a higher amount is specified in Exhibit A to the Contract, in which case the Contractor shall provide the additional coverage:

Limit of liability	$1,000,000 per occurrence $3,000,000 aggregate

5. <u>Worker's Compensation.</u>

A. The Contractor shall provide the following coverage in accordance with M.G.L. c.149, § 34A and c. 152, as amended, unless a higher coverage is specified in Exhibit A to the Contract, in which case the Contractor shall provide the higher coverage:

Worker's Compensation	Statutory limits
Employer's Liability	$ 500,000 each accident $ 500,000 disease per employee $ 500,000 disease policy aggregate

B. If specified in Exhibit A to the Contract the policy must be endorsed to cover United States Longshoremen & Harborworkers Act (USLHW), Maritime Liability for $1,000,000/$1,000,000 or Federal Employer's Liability Act liability.

C. The policy shall contain a waiver of subrogation in favor of the Awarding Authority and Owner.

6. <u>Builder's Risk/ Installation Floater/Stored Materials.</u>

A. The Contractor shall purchase and maintain coverage against loss or damage on all Work included in this Contract in an amount equal to the Contract Price. Such coverage shall be written on an all risks basis or equivalent form and shall include, without limitation, insurance against perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, terrorism ("certified" and "non-certified"), collapse, earthquake, flood (if the project is not in an "A" or a "V" flood zone), windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Designer's and Contractor's services and expenses required as a result of such insured loss. Unless otherwise specified in this Contract, the limits for earthquake and flood shall be the lesser of the Contract Price or $10,000,000. This policy and/or installation floater shall include transportation and stored materials coverage in an amount equal to the value of the stored materials as required in Article XIV.6.C. below.

B. When Work will be completed on existing buildings owned by the Owner, the Contractor shall provide an installation floater, in the full amount of the Contract Price. Such coverage shall be written on an all risks basis or equivalent form and shall include, without limitation, insurance against perils of fire (with extended coverage) and physical loss or

damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood (if the project is not in an "A" or a "V" flood zone), windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Designer's and Contractor's services and expenses required as a result of such insured loss. Unless otherwise specified in this Contract, the limits for earthquake and flood shall be the lesser of the Contract Price or $10,000,000. This policy and/or installation floater shall include transportation and Stored Materials coverage in an amount equal to the value of the stored materials as required in Article XIV.6.C. below.

C. The Contractor shall maintain insurance on delivered and/or stored material designated to be incorporated in the Work against fire, theft or other hazards. Any loss or damage of whatever nature to such material while stored at an off -Site location shall be forthwith replaced by the Contractor at no expense to the Awarding Authority.

D. The policy or policies shall specifically state that they are for the benefit of and payable to the Awarding Authority, the Owner, the Contractor, Subcontractors, and all persons furnishing labor or labor and materials for the Work, as their interests may appear. The policy or policies shall list the Awarding Authority, the Owner, the Contractor, and Subcontractors of any tier as named insureds.

E. Coverage shall include any costs for work performed by the Designer or any consultant as the result of a loss experienced during the term of this Contract.

F. Coverage shall include permission for temporary occupancy and a waiver of subrogation in favor of the Awarding Authority and Owner

G. Coverage shall be maintained until Final Acceptance by the Awarding Authority and Owner of the Contract and final payment has been made.

H. A loss under the property insurance shall be adjusted by the Contractor as fiduciary and made payable to the Contractor as fiduciary for the insureds. The Contractor shall pay the Subcontractors their just shares of insurance proceeds received by the Contractor and shall require Subcontractors to make payments to their sub-Subcontractors in similar manner.

7. Umbrella Coverage.

The Contractor shall provide umbrella coverage in a form at least as broad as primary coverages required by subparagraphs 2, 3 and 5 of this Article in the following amount unless a higher amount is specified in Exhibit A to the Contract, in which case the Contractor shall provide the higher amount:

Contract Price:	Limit of Liability:
Under $1,000,000	$2,000,000 per occurrence
$1,000,001 -- $5,000,000	$5,000,000 per occurrence
$5,000,001-- $10,000,000	$10,000,000 per occurrence
$10,000,001 and over	$25,000,000 per occurrence

8. Additional Types of Insurance.

The Contractor shall provide such other types of insurance as may be required by Exhibit A to the Contract.

ARTICLE XV
INDEMNIFICATION

1. Generally.

To the fullest extent permitted by law, the Contractor shall indemnify, defend (with counsel appointed as a Special Assistant Attorney General and subject to the supervision of the Attorney General of the Commonwealth of Massachusetts as required by M.G.L. c. 12, § 3) and hold harmless the Owner, Awarding Authority and Designer and their officers, agents, divisions, agencies, employees, representatives, successors and assigns from and against all claims, damages, losses and expenses, including but not limited to court costs and attorneys' fees, arising out of or resulting from the performance of the Work, including but not limited to those arising or resulting from: labor performed or furnished and/or materials used or employed in the performance of the Work; violations by Contractor, any Subcontractor, or by any person directly or indirectly employed or used by any of them in the performance of the Work (including, without limitation, suppliers) or anyone for whose acts any of them may be liable (Contractor, Subcontractor and all such persons herein collectively called "Contractor's Personnel") of any Laws; violations of any provision of this Contract by any of Contractor's Personnel; injuries to any persons or damage to any property in connection with the Work; any act, omission, or neglect of Contractor's Personnel.

The Contractor shall be obligated as provided above, regardless of whether or not such claims, damages, losses and/or expenses, are caused in whole or in part by the actions or inactions of a party indemnified hereunder. In any and all claims by Contractor's Personnel against parties indemnified hereunder, the Contractor's indemnification obligation set forth above shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Article XV.

2. Designer's Actions.

The obligations of the Contractor under Section 1 above shall not extend to the liability of the Designer, its agents or employees, arising out of (i) the preparation or approval of maps, Drawings, opinions, reports, surveys Change Orders, designs, or Specifications, or (ii) the giving of or the failure to give directions or instructions by the Designer, its agents to employees provided such giving or failure to give is the primary cause of the injury or damage.

3. Survival.

The provisions of this Article XV are intended to survive Final Acceptance and/or any termination of this Contract.

ARTICLE XVI
PERFORMANCE AND PAYMENT BONDS

1. Contractor Bonds.

A. The Contractor shall provide performance and payment (labor and materials) bonds in the form provided by the Awarding Authority, executed by a surety licensed by the Commonwealth of Massachusetts Division of Insurance and whose name appears on United States Treasury Department Circular 570. Each such bond shall be in the amount of the Contract Price.

B. If at any time prior to final payment to the Contractor, the Contractor's surety:

(1) is adjudged bankrupt or has made a general assignment for the benefit of its creditors;

(2) has liquidated all assets and/or has made a general assignment for the benefit of its creditors;

(3) is placed in receivership;

(4) otherwise petitions a state or federal court for protection from its creditors; or

(5) allows its license to do business in Massachusetts to lapse or be revoked;

then the Contractor shall, within twenty-one (21) days of any such action listed above, provide the Awarding Authority with new performance and payment bonds as described in Article XVI.1.A above. Such bonds shall be provided solely at the Contractor's expense.

2. Subcontractor Bonds.

A. If the Contractor provided in its General Bid that any or all filed Subcontractors shall provide the Contractor with payment and performance bonds for the full amount of their respective Subcontracts, then the costs for said bonds shall be the responsibility of the Contractor. Irrespective of whether the Contractor requests payment and performance bonds from their respective Subcontractors, the Contractor understands that if the Subcontractor defaults or is terminated, the Contractor shall have full responsibility for all costs and expenses related to said default or termination.

B. If the Contractor provided in its General Bid that filed Subcontractors shall provide bonds, and subsequently waives the requirement, the Contractor shall give the Awarding Authority a written certification that the Contractor understands that if the filed Subcontractor defaults or is terminated, the Contractor shall have full responsibility for all costs and expenses related to said default or termination and the Awarding Authority shall be entitled to a credit adjustment to the Contract Price in an amount equal to the bond premium Contractor would have paid had Contractor required the filed Subcontractor to provide such bonds. The Awarding Authority may, at its election, either issue a credit Change Order, withhold such amount from any payments due the Contractor and/or receive a payment from the Contractor for such amount.

ARTICLE XVII
TERMINATION OF CONTRACT

1. <u>Termination for Cause.</u>

A. The Awarding Authority may without prejudice to any other right or remedy deem this Contract terminated for cause if any of the following defaults shall occur and not be cured within three (3) days after the giving of notice thereof by the Awarding Authority to the Contractor and any surety that has given bonds in connection with this Contract:

(1) The Contractor has filed a petition, or a petition has been filed against the Contractor with its consent, under any federal or state law concerning bankruptcy, reorganization, insolvency or relief from creditors, or if such a petition is filed against the Contractor without its consent and is not dismissed within sixty (60) days; or if the Contractor is generally not paying its debts as they become due; or if the Contractor becomes insolvent; or if the Contractor consents to the appointment of a receiver, trustee, liquidate, custodian or the like of the Contractor or of all or any substantial portion of its assets and such appointment or possession is not terminated within sixty (60) days; or if the Contractor makes an assignment for the benefit of creditors;

(2) The Contractor refuses or fails, except in cases for which extension of time is provided under this Contract's express terms, to supply enough properly skilled workers or proper materials to perform its obligations under this Contract, or the Awarding Authority as determined that the rate of progress required for the timely completion of the Work is not being met;

(3) The Contractor fails to make prompt payment to Subcontractors or for materials, equipment, or labor;

(4) All or a part of the Work has been abandoned;

(5) The Contractor has sublet or assigned all or any portion of the Work, the Contract, or claims thereunder, without the prior written consent of the Owner, except as expressly permitted in this Contract;

(6) The Contractor has failed to comply with Laws;

(7) The Contractor fails to maintain or provide to the Awarding Authority evidence of the insurance or bonds required by this Contract, or

(8) The Contractor has failed to prosecute the Work or any portion thereof as required under this Contract or has otherwise breached any material provision of this Contract.

B. The Awarding Authority shall give the Contractor and any surety notice of such termination for cause, but the giving of notice of such termination shall not be a condition precedent or subsequent to the termination's effectiveness. In the event of such termination, and without limiting any other available remedies, the Awarding Authority may, at its option:

(1) hold the Contractor and its sureties liable in damages for a breach of Contract;

(2) notify the Contractor to discontinue all work, or any part thereof, and the Contractor shall discontinue all work, or any part thereof, as the Owner may designate;

(3) complete the Work, or any part thereof, and charge the expense of completing the Work or part thereof, to the Contractor;

(4) require the surety or sureties to complete the Work and perform all of the Contractor's obligations under this Contract;

(5) take such other lawful action as is deemed by the Awarding Authority to be in the best interest of the Owner.

If the Awarding Authority elects to complete all or any portion of the Work as specified in Article XVII.1.B.(3) above, it may take possession of all materials, equipment, tools, machinery, implements at or near the Site owned by the Contractor and finish the Work at the Contractor's expense by whatever means the Awarding Authority may deem expedient; and the Contractor shall cooperate at its expense in the orderly transfer of the same to a new contractor or to the Awarding Authority as directed by the Awarding Authority. In such case, the Awarding Authority shall not make any further payments to the Contractor until the Work is completely finished. The Owner shall not be liable for any depreciation, loss or damage to said materials, machinery, implements or tools during said use and the Contractor shall be solely responsible for their removal from the Site after the Owner has no further use for them. Unless so removed within fifteen days after notice to the Contractor to do so, they may be sold at public auction, after publication of notice thereof at least twice in any newspaper published in the county where the Work is being performed, and the proceeds credited to the Contractor's account; or they may, at the option of the Awarding Authority, be stored at the Contractor's expense subject to a lien for the storage charges.

C. Damages and expenses incurred under Article XVII.1.B above shall include, but not be limited to, costs for the Designer's extra services required, in the opinion of the Awarding Authority, to successfully inspect and administer the construction contract through Final Acceptance of the Work.

D. Expenses charged under Article XVII.1.B above may be deducted and paid by the Awarding Authority out of any moneys then due or to become due the Contractor under this Contract.

E. All sums damages, and expenses incurred by the Owner to complete the Work shall be charged to the Contractor. In case the damages and expenses charged are less than the sum that would have been payable under this Contract if the same had been completed by the Contractor, the Contractor shall be entitled to receive the difference. In case such expenses shall exceed the said sum, the Contractor shall pay the amount of the excess to the Owner.

2. <u>Termination For Convenience.</u>

A. The Awarding Authority may terminate this Contract for convenience even though the Contractor is not in default by giving notice to the Contractor specifying in said notice the date of termination.

B. In case of such termination without cause, the Contractor shall be paid:

(1) all sums due and owing under this Contract through the date of termination, including any retainage withheld to the date of termination, less any amount which the Awarding Authority determines is necessary to correct or complete the Work performed to the date of termination; plus

(2) a reasonable sum to cover the expenses which Contractor would not have incurred but for the early termination of the Contract, such as demobilization of the work force, restocking charges, termination fees payable to Subcontractors.

C. Lost profits shall not be payable. The payment provided in Article XVII.2.B above shall be considered to fully compensate the Contractor for all claims and expenses and those of

any consultants, Subcontractors, and suppliers, directly or indirectly attributable to the termination.

3. Contractor's Duties Upon Termination For Convenience.

Upon termination of this Contract for convenience as provided above in Article XVII.2, the Contractor shall: (1) stop the Work; (2) stop placing orders and subcontracts in connection with this Contract; (3) cancel all existing orders and subcontracts; (4) surrender the Site to the Awarding Authority in a safe condition; (5) transfer to the Awarding Authority all materials, supplies, work in process, appliances, facilities, equipment and machinery of this Contract, and all plans, Drawings, Specifications and other information and documents used in connection
with this Contract.

ARTICLE XVIII
MISCELLANEOUS PROVISIONS

1. No Assignment by Contractor.

The Contractor shall not assign by power of attorney or otherwise, or sublet or subcontract, the Work or any part thereof, without the previous written consent of the Awarding Authority and shall not, either legally or equitably, assign any of the moneys payable under this Contract, or Contractor's claims hereunder, unless with the like consent of the Awarding Authority, whether said assignment is made before, at the time of, or after the execution of the Contract. The Contractor shall remain responsible for satisfactory performance of all Work sublet or assigned. Consent of the Awarding Authority shall not be deemed to constitute a representation or waiver of any right hereunder by the Awarding Authority as to the qualifications or the responsibility of the Contractor or Subcontractor(s).

2. Non-Appropriation.

The Awarding Authority certifies that at the time of the execution of this Contract, sufficient appropriations exist and shall be encumbered to fund the Contract Price. Payments are subject to appropriation and shall be made only for work performed in accordance with the terms of this Contract. The Contractor shall not be obligated to perform and shall not perform work outside the scope of this Contract without an appropriate amendment to this Contract, and a sufficient appropriation(s) to support such additional work. The Awarding Authority may immediately terminate or suspend this Contract in the event that the appropriation(s) funding this Contract is eliminated or reduced to an amount which will be insufficient to support anticipated future obligations under this Contract. Such termination shall be deemed a termination for convenience subject to the provisions of Article XVII.2 of these General Conditions.

3. Claims by Others Not Valid.

No person other than the Contractor shall acquire any interest in this Contract or claim against the Awarding Authority or Owner hereunder, and no claim by any other person shall be valid except as provided in M.G.L. c. 30, § 39F.

4. No Personal Liability of Public Officials.

No public official, employee, or agent of the Awarding Authority or Owner shall have any personal liability for the obligations of the Awarding Authority or Owner set forth in this Contract.

5. Severability.

The provisions of this Contract are severable, and if any of these provisions shall be held unconstitutional or unenforceable by any court of competent jurisdiction, the decision of such court shall not affect or impair any of the other provisions of this Contract.

6. Choice of Laws.

This Contract shall be governed by the Laws of the Commonwealth of Massachusetts for all purposes, without regard to its Laws on choice of law. All proceedings under this Contract or related to the Project shall be brought in the courts of the Commonwealth of Massachusetts.

7. Standard Forms.

Unless directed otherwise in writing by the Awarding Authority, Contractor shall use the standard forms in use by Awarding Authority appearing in Appendix C to these General Conditions.

8. No Waiver of Subsequent Breach.

No waiver of any breach or obligation of this Contract shall constitute a waiver of any other or subsequent breach or obligation.

9. Remedies Cumulative.

All remedies of the Awarding Authority provided in this Contract shall be construed as cumulative and may be exercised simultaneously or in any order as determined by the Awarding Authority in its sole discretion. The Awarding Authority shall also be entitled as of right to specific performance and equitable relief including the right to an injunction against any breach of any of the provisions of this Contract.

10. Notices.

Notices to the Contractor shall be deemed given when hand delivered to the Contractor's temporary field office at or near the Site, or when deposited in the U.S. mail addressed to the Contractor at the Contractor's address specified in the Contract, or when delivered by courier to either location. Unless otherwise specified in writing by the Awarding Authority, notices and deliveries to the Awarding Authority shall be effective only when delivered to the Awarding Authority at the address specified in the Contract and date-stamped at the reception desk or for which a receipt has been signed by the agent or employee designated by the Awarding Authority to receive official notices.

11. Additional Information.

Recognizing that the Awarding Authority may find it necessary during the progress of the Work to establish the current status of performance under the Contract Documents, the Contractor shall, without limitation of any other requirements of the Contract Documents, promptly provide upon request statements, documents, or information to the Awarding Authority or others regarding the status of the Work, compliance of the Work with the Contract Documents, compliance by the Contractor or any Subcontractor with the Contract Documents, the names of Subcontractors or suppliers, amounts due or to become due, amounts previously paid to Subcontractors or suppliers, estimates of the portion of the Work completed and the cost of completing the Work, and such other matters within the scope of the Contractor's performance under the Contract Documents as the Awarding Authority may reasonably require.

12. Information Confidential.

Except as required for the discharge of its duties to the Awarding Authority under this Contract, or required by subpoena or court order, the Contractor and any of its Subcontractors agree to hold all information, documents, and materials obtained or developed in connection with its performance under this Contract (including, without limitation, all prints, plans, policies, procedures, studies, specifications and drawings, which relate to internal layout and structural elements, electrical and mechanical systems, security measures, emergency preparedness, threat or vulnerability assessments, and any other records relating to the security or safety of persons or buildings, structures, facilities, utilities, transportation or other infrastructure located within the Commonwealth) that the Contractor and any of its Subcontractors should reasonably know to be of a confidential or sensitive nature ("Confidential Information") in the strictest confidence, and shall not communicate, release, or disclose Confidential Information in any to any third party without the prior written Approval by the Awarding Authority. The Contractor shall not use any Confidential Information other than for the performance of the Work under this Contract. The Contractor shall inform all persons to whom any such Confidential Information has been or will be communicated, released, or disclosed of the privileged and confidential nature of Confidential Information, and shall ensure that all necessary steps are taken so that such Confidential Information is treated confidentially. Without limiting the foregoing, if the Project is a designated "Security Sensitive Information" project, the Contractor shall execute separate "Security Sensitive Information Procedures" and confidentiality agreements and shall comply with such document protection requirements as may be referenced in said agreement.

13. Consequential Damages.

In no event shall DCAMM be liable to the Contractor except for obligations expressly assumed by the Awarding Authority or the Designer under the Contract Documents, nor shall the Awarding Authority ever be liable to the CM for indirect, special or consequential damages.

14. Conflict of Interest.

The Contractor shall familiarize its employees assigned to perform services under this Contract with the provisions of M.G.L. c. 268A (the Massachusetts conflict-of-interest statute). The Contractor that the CM is an "interested party" for purposes of the aforementioned statute. Accordingly, if the Awarding Authority is a "state agency" for

purposes of the aforementioned statute, the Contractor and its employees and agents shall not offer or provide any employee of the Awarding Authority any gift, gratuity, favor, meal, entertainment, loan or other item of monetary value. The Contractor warrants and represents that it currently has no interest and shall not acquire any interest, direct or indirect, which would be adverse to or conflict in any manner with the performance of its services under this Contract or with the interest of the Awarding Authority or the Project. The Contractor further agrees that in the performance of this Contract no person or entity having any such adverse or conflicting interest shall be employed or granted a Subcontract. Except with the Awarding Authority's knowledge and express consent, the Contractor shall not engage in any activity, or accept any employment, interest or contribution that would reasonably appear to be adverse to the interests of the Awarding Authority or to compromise the Contractor's professional judgment with respect to the Project. The Contractor has a continuing obligation to divulge to the Awarding Authority all circumstances of its relationships with third parties, as well as any other interests that may have an effect on the Awarding Authority or the Project at the time of execution of this Contract or during its effectiveness. If the Awarding Authority believes that there is or has been a conflict of interest, or the appearance of a conflict of interest, it will so notify the Contractor. The Contractor shall make full disclosure of all material facts, and shall have a period of thirty (30) days after receipt of such notice to cure the conflict of interest or the appearance of conflict of interest, including the right to request a meeting with the Awarding Authority to explain its position. If the conflict of interest or appearance of conflict of interest is not cured to the satisfaction of the Awarding Authority or the controversy otherwise resolved prior to expiration of such thirty (30) days period, the Contractor shall be deemed to be in default of this Contract and the Awarding Authority may exercise any remedies available to it under this Contract or applicable law.

15. <u>Sexual Harassment and Workplace Violence Prevention.</u>

The Contractor shall promote a workplace that is free from sexual harassment and workplace violence, and to require all of its subcontractors to agree to the same. The Commonwealth does not tolerate sexual harassment, workplace violence, or a hostile work environment. It is the goal of the Commonwealth of Massachusetts to promote a workplace where people treat each other with dignity and respect. This applies to all Commonwealth employees, consultants, contractors and subcontractors regardless of tier, and covers actions within, by, among, and across these groups as they interact with each other. Without limiting its other rights and remedies of removal and/or termination, the Awarding Authority reserves the right to remove or terminate individuals and/or contractors whose conduct violates any of the provisions of this paragraph.

END OF GENERAL CONDITIONS
APPENDICES APPEAR ON THE FOLLOWING PAGES

APPENDIX A to General Conditions of the Contract

The following provisions form Article XII of the General Conditions of the Contract where DCAMM is the Awarding Authority.

EQUAL EMPLOYMENT OPPORTUNITY, NON-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM.

1. Compliance Generally.

For purpose of this Article, "minority" refers to Asians, Blacks, Western Hemisphere Hispanics, Native Americans, and Cape Verdeans; "Commission" refers to the Massachusetts Commission Against Discrimination. During the performance of this Contract, the Contractor and all of its Subcontractors (hereinafter collectively referred to as the Contractor) shall comply with all applicable equal employment opportunity, non-discrimination and affirmative action requirements, including but not limited to the following:

2. Non-Discrimination and Affirmative Action.

A. The Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, ancestry, sex, gender identity, sexual orientation, age, handicap, mental illness, genetic information or active military duty. The aforesaid provision shall include, but not be limited to, the following: employment upgrading, demotion or transfer; recruitment advertising; recruitment layoff; termination; rates of pay or other forms of compensation; conditions or privileges of employment; and selection for apprenticeship. The Contractor shall comply with the provisions of M.G.L. c.151B and all other applicable anti-discrimination and equal opportunity laws.

B. The Contractor shall comply with the provisions of Executive Order 526, entitled Order Regarding Nondiscrimination, Diversity, Equal Opportunity and Affirmative Action, which prohibits unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background. Executive Order 526 is herein incorporated by reference and made a part of this Contract.

Pursuant to Executive Order 526 the Contractor and any subcontractors may not engage in discriminatory employment practices; and the Contractor must certify that it is in compliance with all applicable federal and state laws, rules, and regulations governing fair labor and employment practices; and commit to purchasing supplies and services from certified minority or women-owned businesses, small businesses, or businesses owned by socially or economically disadvantaged persons or persons with disabilities. These provisions shall be enforced through the contracting agency, the Operational Services Division, and/or the Massachusetts Commission Against Discrimination. Any breach shall be regarded as a material breach of Contract that may subject Contractor to appropriate sanctions.

C. In connection with the performance of the Work, the Contractor shall undertake in good faith affirmative action measures designed to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, age, sexual orientation, or sex, and to eliminate and remedy any effects of such discrimination in the past. Such affirmative action shall entail positive and aggressive measures to ensure equal opportunity in the areas of hiring, upgrading, demotion or transfer, recruitment, layoff or termination, rate of compensation, and in-service or apprenticeship training programs. This affirmative action shall include all action required to guarantee equal employment opportunity for all persons, regardless of race, color, religious creed, national origin, age, sexual orientation, or sex. A purpose of this provision is to ensure to the fullest

extent possible an adequate supply of skilled tradesmen for future public construction projects.

D. If the Contractor shall use any subcontractor on any work performed under this Contract, the Contractor shall take affirmative steps to negotiate with qualified minority and women subcontractors. These affirmative steps shall cover both pre-bid and post-bid periods. It shall include notification to the State Office of Minority and Women Business Assistance or its designee, while bids are in preparation, of all products, work or services for which the Contractor intends to negotiate bids. In all solicitations either by competitive bidding or negotiation made by the Contractor either for work to be performed under a subcontract or for the procurement of materials or equipment, each potential subcontractor or supplier shall be notified in writing by the Contractor of the Contractor's obligations under this Contract relative to non-discrimination and affirmative action.

E. As part of its obligation of remedial action under this Article, the Contractor shall maintain on this project not less than the percent ratio set forth in the Owner - Contractor Agreement of minority employee worker hours to total worker hours in each job category including but not limited to bricklayers, carpenters, cement masons, electricians, ironworkers, operating engineers, and those "classes of work" enumerated in M.G. L. c. 149, s. 44F.

G. In the hiring of minority journeypersons, apprentices, trainees and advanced trainees, the Contractor shall rely on referrals from a multi-employer affirmative action program approved by the Commission, traditional referral methods utilized by the construction industry, and referrals from agencies, not more than three in number at any one time, designated by the Liaison Committee or the Awarding Authority.

3. <u>Liaison Committee, Reports and Records.</u>

A. At the option of the Awarding Authority, there may be established for the term of this Contract a body to be known as the Liaison Committee. The Liaison Committee shall be composed of one representative each from the Awarding Authority, the Commission and such other representatives as may be designated by the Commission in conjunction with the Awarding Authority. The Contractor (or his agent, if any, designated by him as the on-Site equal employment opportunity officer) shall recognize the Liaison Committee as an affirmative action body, and shall establish a continuing working relationship with the Liaison Committee, consulting with the Liaison Committee on all matters related to minority recruitment, referral, employment and training.

B. The Contractor shall prepare projected staffing tables on a quarterly basis. These shall be broken down into projections, by week, of workers required in each trade. Copies shall be furnished one week in advance of the commencement of the period covered, and also when updated, to the Awarding Authority and Liaison Committee. The Contractor shall prepare weekly reports in a form approved by the Awarding Authority of hours worked in each trade by each employee, identified as minority or non-minority. Copies of these shall be provided at the end of each such week to the Awarding Authority and to the Liaison Committee.

C. Records of employment referral orders, prepared by the Contractor, shall be made available to the Awarding Authority and to the Liaison Committee on request.

D. A designee of the Awarding Authority and a designee of the Liaison Committee shall each have right to access to the Site.

E. The Contractor shall comply with the provisions of M.G.L. c. 151B as amended, of the Massachusetts General Laws, both of which are herein incorporated by reference and made a part of this Contract.

F. The Contractor shall provide all information and reports required by the Awarding Authority or the Commission on forms and in accordance with instructions issued by either

of them and will permit access to its facilities and any books, records, accounts and other sources of information which may be determined by the Awarding Authority or the Commission to affect the employment of personnel. This provision shall apply only to information pertinent to the Owner's supplementary affirmative action Contract requirements. Where information required is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to the Awarding Authority or the Commission as appropriate and shall set forth what efforts he has made to obtain the information.

4. <u>Sanctions.</u>

A. Whenever the Awarding Authority, the Commission, or the Liaison Committee believes the Contractor or any Subcontractor may not be operating in compliance with the terms of this Article, the Commission shall directly, or through its designated agent, conduct an appropriate investigation, and may confer with the parties, to determine if such Contractor is operating in compliance with the terms of this Article. If the Commission or its agent finds the Contractor or any Subcontractor not in compliance, it may make a preliminary report on non-compliance, and notify such Contractor in writing of such steps as will in the judgment of the Commission or its agent bring such Contractor into compliance. In the event that such Contractor fails or refuses to fully perform such steps, the Commission **may** make a final report of non-compliance, and recommend to the Awarding Authority the imposition of one or more of the sanctions listed below. If, however, the Commission believes the Contractor or any Subcontractor has taken or is taking every possible measure to achieve compliance, it shall not make a final report of non-compliance. Within fourteen days of the receipt of the recommendations of the Commission, the Awarding Authority shall move to impose one or more of the following sanctions, as it may deem appropriate to attain full and effective enforcement:

(1) The recovery by the Awarding Authority from the Contractor of 1/100 of 1% of the Contract award price or $1,000 whichever sum is greater, in the nature of liquidated damages or, if a Subcontractor is in non-compliance, the recovery by the Awarding Authority from the Contractor, to be assessed by the Contractor as a back charge against the subcontractor, of 1/10 of 1% of the sub-Contract Price, or $400 whichever sum is greater, in the nature of liquidated damages, for each week that such party fails or refuses to comply;

(2)The suspension of any payment or part thereof due under the Contract until such time as the Contractor or any subcontractor is able to demonstrate his compliance with the terms of the Contract;

(3) The termination or cancellation of the Contract, in whole, or in part, unless the Contractor or any Subcontractor is able to demonstrate within a specified time his compliance with the terms of the contract;

(4)The denial to the Contractor or any subcontractor of the right to participate in any future contracts awarded by the Awarding Authority for a period of up to three years.

B. If at any time after the imposition of one or more of the above sanctions a Contractor is able to demonstrate that it is in compliance with this Article, the Contractor may request the Awarding Authority, in consultation with the Commission, to suspend the sanctions conditionally, pending a final determination by the Commission as to whether the Contractor is in compliance. Upon final determination of the Commission, the Awarding Authority, based on the recommendation of the Commission, shall either lift the sanctions or reimpose them.

C. Sanctions recommended by the Commission and enumerated under Section 4 above shall not be imposed by the Awarding Authority except after an adjudicatory proceeding, as that term is used M.G.L. c. 30A, has been conducted. No investigation by the Commission

or its agent shall be initiated without prior notice to the Contractor. **D.** Notwithstanding the provisions of 4A-4C above, if the Awarding Authority determines after investigation that the Contractor or any Subcontractor is not in compliance with the terms of this Article, it may suspend any payment or portion thereof due under the Contract until the contractor demonstrates to the satisfaction of the Awarding Authority compliance with the terms of this Article. This temporary suspension of payments by the Awarding Authority is separate from the sanctions set forth in Section 4A-4C of this Article above, which are determined by MCAD and recommend to the Awarding Authority. Payment may be suspended only after the Contractor and any other interested party shall have been given the opportunity to present evidence in support of its position at an informal hearing held by the Awarding Authority, and the Awarding Authority has concluded upon review of all the evidence that such penalty is justified. Payment shall not be suspended if the Awarding Authority finds that the Contractor made its best efforts to comply with this Article, or that some other justifiable reason exists for waiving the provisions of this Article in whole or in part.

END OF APPENDIX A

APPENDIX B to General Conditions of the Contract

The following provisions form Article XIII of the General Conditions of the Contract where DCAMM is the Awarding Authority.

GOALS FOR PARTICIPATION BY MINORITY BUSINESS ENTERPRISES AND WOMEN BUSINESS ENTERPRISES (M.G.L. c. 7C, § 6 and EXECUTIVE ORDERS 526 & 565)

1. Goals.

A. The goals for minority business enterprise and woman business enterprise participation established for this Contract are as set forth in the Owner - Contractor Agreement**.**

B. The Contractor and all Subcontractors, sub-subcontractors, and materials suppliers shall comply with all of the terms and conditions of this Article, which include the provisions pertaining to MBE/WBE participation set forth in the Owner - Contractor Agreement in order to meet the MBE/WBE participation goals established for this Contract.

2. MBE/WBE Participation Credit.

A. If the Contractor is itself an MBE or WBE, MBE or WBE participation credit shall be given in an amount equal to the entire Contract Price less the value of the work actually performed by other MBE or WBE firms on the Contract. If the Contractor is not an MBE or WBE, then MBE/WBE participation credit will be given for the value of the Work that is actually performed by each MBE or WBE subcontractor or sub-subcontractor.

B. If the Contractor is a joint venture with one or more MBE/WBE joint venturers, MBE/WBE participation credit shall be given to the joint venture as follows:

(1) If the joint venture is certified by the Massachusetts Supplier Diversity Office (SDO) as an MBE or WBE, MBE/WBE participation credit shall be given in an amount equal to the entire Contract Price.

(2) If the joint venture is not certified as an MBE or WBE by the SDO, MBE/WBE participation credit shall be given to the joint venture for the value of the Work that is performed by the MBE/WBE joint venturer(s), and for the value of the Work that is actually performed by each MBE or WBE subcontractor or sub-subcontractor.

C. If an MBE/WBE supplies but does not install equipment or materials, MBE/WBE participation credit shall be given only if the MBE/WBE supplier is regularly engaged in sales of equipment or supplies to the construction industry from an established place of business. MBE/WBE participation credit shall be given the full amount of the purchase order only if the MBE/WBE supplier manufactures the goods or substantially alters them before resale. In all other cases, MBE/WBE participation credit shall be given for 15% of the purchase order.

D. MBE participation credit shall be given for the work performed by MBEs only, and WBE participation credit shall be given for the work performed by WBEs only. MBE participation may not be substituted for WBE participation, nor may WBE participation be substituted for MBE participation.

3. Establishing MBE/WBE Status.

A. A minority owned business shall be considered an MBE only if it has been certified as a minority business enterprise by the Supplier Diversity Office ("SDO").

B. A woman owned business shall be considered a WBE only if it has been certified as a woman business enterprise by SDO.

C. Certification as a disadvantaged business enterprise ("DBE"), certification as an MBE/WBE by any agency other than SDO, or submission of an application to SDO for certification as an MBE/WBE shall not confer MBE/WBE status on a firm for the purposes of this Contract. Please note that only firms SDO certified as MBE or WBEs can be credited toward meeting project MBE or WBE goals.

4. Subcontracts With MBE/WBEs.

Within thirty (30) days after the award of this Contract, the Contractor shall (i) execute a subcontract with each MBE/WBE Subcontractor which has executed a Letter of Intent Approved by the Awarding Authority, (ii) cause its Subcontractors to execute a sub-subcontract with each MBE/WBE sub-subcontractor they committed to utilize, and (iii) furnish the Awarding Authority with a signed copy of each such subcontract and sub-subcontract through DCAMM's Online Compliance Reporting System.

5. Performance of Contract Work by MBE/WBEs.

A. The Contractor shall not perform with its own organization, or subcontract or assign to any other firm, work designated to be performed by any MBE/WBE in the Letters of Intent or Schedule for MBE/WBE Participation without the prior written Approval of the Awarding Authority, nor shall any MBE/WBE assign or subcontract to any other firm, or permit any other firm to perform any of its MBE/WBE Work without the prior written Approval of the Awarding Authority. Any such unapproved assignment, subcontracting, sub-subcontracting, or performances of MBE/WBE Work by others shall be a change in the MBE/WBE Work for the purposes of this Contract. The Awarding Authority WILL NOT APPLY TO THE MBE OR WBE PARTICIPATION GOAL(S) ANY SUMS ATTRIBUTABLE TO SUCH UNAPPROVED ASSIGNMENTS, SUB-CONTRACTS, SUB-SUBCONTRACTS, OR PERFORMANCE OF MBE/WBE WORK BY OTHERS.

B. The Contractor shall be responsible for monitoring the performance of MBE/WBE Work to ensure that each scheduled MBE/WBE performs its own MBE/WBE Work with its own workforce.

C. The Contractor and each MBE/WBE shall provide the Awarding Authority with all information and documentation that the Awarding Authority determines is necessary to ascertain whether or not an MBE/WBE has performed its own MBE/WBE Work. At the discretion of the Awarding Authority, failure to submit such documentation to the Awarding Authority shall establish conclusively for the purpose of giving MBE/WBE participation credit under this Contract that such MBE/WBE did not perform such work.

6. Notification of Changes in MBE/WBE Work.

A. If at any time during the performance of the Contract the Contractor determines or has reason to believe that a scheduled MBE/WBE is unable or unwilling to perform its MBE/WBE Work, or that there has been or will be a change in any MBE/WBE Work, or that the Contractor will be unable to meet the MBE/WBE participation goal(s) for this Contract for any reason, the Contractor shall immediately notify the Awarding Authority Contract Compliance Office in writing of such circumstances.

B. Any notice of a change in MBE/WBE Work pursuant to subparagraph "A" above shall include a revised Schedule for MBE/WBE Participation, and additional or amended Letters of Intent and subcontracts, as the case may be.

7. <u>Actions Required If There is a Reduction in MBE/WBE Participation.</u>

A. In the event there is a change or reduction in any MBE/WBE Work which will result in the Contractor failing to meet the MBE/WBE participation goal(s) for this Contract, other than a reduction in MBE/WBE Work resulting from a Change Order initiated by the Awarding Authority, then the Contractor shall immediately undertake a diligent, good faith effort to make up the shortfall in MBE/WBE participation as follows:

(1) The Contractor shall identify all items of the Work remaining to be performed under the Contract that may be made available for subcontracting to MBE/WBEs. The Contractor shall send a list of such items of work to the Awarding Authority, together with a list of the remaining items of the Work that were not made available to MBE/WBEs and the reason for not making such work available for subcontracting to MBE/WBEs.

(2) The Contractor shall send written notices soliciting proposals to perform the items of the Work that may be made available for subcontracting to MBE/WBEs to all MBE/WBEs qualified to perform such work. The Contractor shall advise the Awarding Authority of (i) each MBE/WBE solicited, and (ii) each MBE/WBE listed in the SDO directory under the applicable trade category who was not solicited and the reasons therefor. The Contractor shall also advise the Awarding Authority of the dates notices were mailed and provide a copy of the written notice(s) sent.

(3) The Contractor shall make reasonable efforts to follow up the written notices sent to MBE/WBEs with telephone calls or personal visits in order to determine with certainty whether the MBE/WBEs were interested in performing the work. Phone logs or other documentation must be submitted to the Awarding Authority evidencing this effort.

(4) The Contractor shall make reasonable efforts to assist MBE/WBEs that need assistance in obtaining insurance, bonds, or lines of credit in order to perform work under the Contract, and shall provide the Awarding Authority with evidence that such efforts were made.

(5) The Contractor shall provide the Awarding Authority with a statement of the response received from each MBE/WBE solicited, including the reason for rejecting any MBE/WBE who submitted a proposal, if applicable.

(6) The Contractor shall take any additional measures reasonably requested by the Awarding Authority to meet the MBE/WBE participation goal(s) established for this Contract, including, without limitation, placing advertisements in appropriate media and trade association publications announcing the Contractor's interest in obtaining proposals from MBE/WBEs, and/or sending written notification to MBE/WBE economic development assistance agencies, trade groups and other organizations notifying them of the project and of the work available to be subcontracted by the Contractor to MBE/WBEs.

B. If the Contractor is unable to meet the MBE/WBE participation goals for this Contract after complying fully with each of the requirements of paragraph "A" above, and the Contractor is otherwise in full compliance with the terms of this Article, the Awarding Authority may reduce the MBE/WBE participation goals for this Contract to the extent that such goals cannot be achieved.

8. <u>Suspension of Payment and/or Performance for Noncompliance.</u>

A. If at any time during the performance of this Contract, the Awarding Authority determines or has reason to believe that (1) there has been a change or reduction in any MBE/WBE Work which will result in the Contractor failing to meet the MBE/WBE

participation goal(s) for this Contract, other than a reduction in MBE/WBE Work resulting from a change in the Contract work ordered by the Awarding Authority, and (2) the Contractor has failed to comply fully with all of the terms and conditions of paragraphs 1 through 7 above, the Awarding Authority may:
(1) suspend payment to the Contractor of an amount up to the full value of the work which was to have been performed by an MBE/WBE pursuant to the Contractor's Schedule for MBE/WBE Participation but which was not so performed, in order to ensure that sufficient Contract funds will be available if liquidated damages are assessed pursuant to paragraph 9, and/or
(2) suspend the Contractor's performance of this Contract in whole or in part.

B. The Awarding Authority shall give the Contractor prompt written notice of any action taken pursuant to paragraph A above and shall give the Contractor and any other interested party, including any MBE/WBEs, an opportunity to present evidence to the Awarding Authority that the Contractor is in compliance with the requirements of this Article, or that there is some justifiable reason for waiving the requirements of this Article in whole or in part. The Awarding Authority may invite SDO and the Massachusetts Commission Against Discrimination to participate in any proceedings undertaken pursuant to this paragraph.

C. Upon a showing that the Contractor is in full compliance with the requirements of this Article, or that the Contractor has met or will meet the MBE/WBE participation goals for this Contract, the Awarding Authority shall release any funds withheld pursuant to clause A(1) above, and lift any suspension of the Contractor's performance under clause A(2) above.

9. <u>Liquidated Damages; Termination.</u>

A. If payment by the Awarding Authority or performance by the Contractor is suspended by the Awarding Authority as provided in paragraph 8 above, the Awarding Authority shall have the following rights and remedies if the Contractor thereafter fails to take all action necessary to bring the Contractor into full compliance with the requirements of this Article, or if full compliance is no longer possible because the default of the Contractor is no longer susceptible to cure, if the Contractor fails to take such other action as may be required by the Awarding Authority to meet the MBE/WBE participation goals set forth in this Contract:
(1) the Awarding Authority may terminate this Contract, and/or
(2) the Awarding Authority may retain from final payment to the Contractor, as liquidated damages, an amount equal to the difference between (x) the total of the MBE/WBE participation goals set forth in this Contract, and (y) the amount of MBE/WBE participation credit given to the Contractor for MBE/WBE Work performed under this Contract as determined by the Awarding Authority, the parties agreeing that the damages for failure to meet the M/BE/WBE participation goals are difficult to determine and that the foregoing amount to be retained by the Awarding Authority represents the parties' best estimate of such damages. Any liquidated damages will be assessed separately for MBE and WBE participation.

B. Before exercising its rights and remedies hereunder, the Awarding Authority may, but the Awarding Authority shall not be obligated to, give the Contractor and any other interested party another opportunity to present evidence to the Awarding Authority that

the Contractor is in compliance with the requirements of this Article or that there is some justifiable reason for waiving the requirements of this Article in whole or in part. The Awarding Authority may invite SDO and the Massachusetts Commission Against Discrimination to participate in any proceedings undertaken hereunder.

10. <u>Reporting Requirements.</u>

The Contractor shall submit to the Awarding Authority all information or documentation that is necessary in the judgment of the Awarding Authority to ascertain whether or not the Contractor has complied with any of the provisions of this Article.

11. <u>Awarding Authority's Right to Waive Provisions of this Article in Whole or In Part.</u>
The Awarding Authority reserves the right to waive any provision or requirement of this Article if the Awarding Authority determines that such waiver is justified and in the public interest. No such waiver shall be effective unless in writing and signed by a representative of the Awarding Authority's Compliance Office or the Office of its General Counsel. No other action or inaction by the Awarding Authority shall be construed as a waiver of any provision of this Article.

END OF APPENDIX B

APPENDIX C to the General Conditions of the Contract

INDEX OF REQUIRED CONTRACT ADMINISTRATION FORMS
(Forms used during bidding are located in Attachment B to the Instructions to Bidders)

- ☐ ~~**Form of Subcontract MGL c.149 §44F**~~
- ☐ ~~**Procedure for Payment to Contractors**~~
- ☐ ~~**Payment Voucher Input**~~
- ☐ ~~**Requisition for Payment (DCAMM Form S1b) and Instructions**~~
- ☐ **Instructions and Procedures Regarding Change Orders, Contract Modifications and Equitable Adjustments (DCAMM Form 13)**
- ☐ **Request for Approval of Wages and Rates for Change Order Pricing (DCAMM Form 14)**
- ☐ **Format for Submission of Change Order (DCAMM Form 15) (3 pages)**
- ☐ **Change Order Log (1 Page)**
- ☐ ~~**Daily Time and Material Report for Change Orders 10/17 rev**~~
- ☐ ~~**Request and Agreement for a Change in the Plans**~~
- ☐ **Request and Agreement For Change In the Plans And/Or Specifications and/or Contract (DCAMM Form 5)**
- ☐ **Weekly Payroll Report Form and Statement of Compliance**
- ☐ ~~**Quarterly Projected Workforce Table**~~
- ☐ ~~**Veteran and Service Disabled Veteran Owned Business Enterprise**~~
- ☐ ~~**(VBE/SDVOBE) Participation**~~
- ☐ ~~**Form for Transfer of Title (Work Not Incorporated, DCAMM Form 16)**~~
- ☐ **Payroll & Workforce Report**
- ☐ **Payment Requisition Transmittal (3 pages)**~~**-**~~
- ☐ ~~**Submittal Transmittal (1 page)**~~
- ☐ **Submittal Log**
- ☐ **Request for Information Transmittal (1 page)**
- ☐ **Request for Information Log**
- ☐ ~~**Weekly Site Meeting Template (1 Page)**~~
- ☐ **Certificate of Substantial Completion (E-1)**
- ☐ **Certificate of Final Inspection, Release and Acceptance (E-2)**
- ☐ **Certificate of Payment MBE, WBE, Veteran, Etc.**
- ☐ **Certificate of Payment to Subcontractors, Sub-bidders, suppliers**

END OF APPENDIX C

DCAMM General Conditions of the Contract c. 149 Rev. 06/2020
DMH Revised 8/24/2021

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE FOR ADMINISTRATION AND FINANCE
DIVISION OF CAPITAL ASSET MANAGEMENT
ONE ASHBURTON PLACE, 15th Floor
BOSTON, MASSACHUSETTS 02108

INSTRUCTIONS AND PROCEDURES REGARDING CHANGE ORDERS, CONTRACT MODIFICATIONS AND EQUITABLE ADJUSTMENTS

SECTION 1. STATUTORY AND CONTRACTUAL PROVISIONS

1.01 These procedures and instructions (hereinafter "Procedures") supplement Article VII of DCAMM's General Conditions of the Contract. These Procedures and Article VII are to be considered together and are intended to be mutually complementary, so that all terms are to be considered as part of this Contract. All provisions are intended to be consistent with the Massachusetts Laws governing Change Orders and Equitable Adjustments. Those laws include, but are not limited to: M.G.L. Chapter 7C, Sections 17-21; M.G.L. Chapter 30, Sections 39I, 39J, 39N, 39O, 39P, and 39Q. All parties must keep themselves informed of these laws and any amendments affecting said statutes.

NO CHANGES (ADDITIONS, SUBSTITUTIONS OR ELIMINATIONS) IN THE PLANS, SPECIFICATIONS OR CONTRACT SHALL BE COMMENCED UNTIL RECEIPT BY THE CONTRACTOR OF: (a) **AN APPROVED DCAMM FORM 5** (Gold Sheet Change Order) OR (b) a WRITTEN DIRECTIVE from the DCAMM PROJECT MANAGER AUTHORIZING or DIRECTING such CHANGE. A Directive issued by the Deputy Commissioner, Director, or Deputy Director shall carry the same force as though issued by the Project Manager.

1.02 The purpose of these instructions and procedures is to provide additional detail for calculating equitable adjustments and outlining the change order submission process. The Contractor must provide satisfactory documentation supporting the nature and cost of each change, for an informed decision to be made on whether or not the change order is necessary, justified and priced properly. All parties shall utilize the POTENTIAL CHANGE ORDER PROCESS explained in section 3 below, as well as maintain a POTENTIAL CHANGE ORDER LOG.

1.03 All requests for changes modifying the contract price must be submitted on DCAMM Form 5, prior to the final acceptance of the project. The Contractor waives all rights against the Commonwealth if it fails to comply with this requirement. DCAMM shall be under no obligation to process a request for change after final acceptance of the project.

1.04 The term "request for change" is used throughout these procedures and applies to every request to revise the contract requirements. The request for change must be made in writing, and in accordance with the provisions of the Contract, the General laws, rules, regulations and other procedures of DCAMM.

1.05 If the request for a change is deemed a Life Safety Issue by DCAMM, or if waiting for a formal change order approval will cause damage or increase the cost of the Work, the DCAMM Project Manager may deem the change "Urgent" and issue an email to the Contractor, Deputy Director, Designer, Resident Engineer and any other parties that are involved in the potential change. The email will outline the scope of work, a Not to Exceed dollar value, and a deadline for the paperwork to be submitted to substantiate the cost and completion of the work. The Contractor will add this "Urgent" Potential Change Order to the Log with a status of URGENT and proceed with the work in accordance with the email. If the costs to complete the "Urgent" work are expected to exceed the stated Not to Exceed value, then the Contractor shall advise the DCAMM Project Manager of the anticipated extra costs as soon as known, and shall await further written direction from DCAMM before proceeding with work above the Not to Exceed value.

1.06 Prior to any change order work being performed, the DCAMM Project Manager must have all quotes, estimates and potential costs identified to determine if the change order work should be performed as a lump sum cost to the project, or if the nature of the change is difficult to quantify, then it may be determined to perform the work on a Time and Material basis.

SECTION 2. DIRECTIONS FOR COMPUTING COSTS FOR CHANGES IN THE WORK

2.01 Construction Managers, General Contractors, Subcontractors, Sub-tier Subcontractors and service providers must submit for approval the DCAMM Wage Rate Form (Form 14) at the time their contract is awarded and prior to any change order work being started. DCAMM has changed the calculation for establishing **LABOR BILLING RATES.** Billing rates are calculated by taking the job specific **published** Prevailing Wage Rate for each trade classification and multiplying it by 1.40. Union Contractors may submit their collective bargaining agreement if there are excess fringe expenses over the published prevailing wage rate. These excess fringes will be applied with no mark-ups. The attached forms (as noted in Article VII) will automatically calculate rates as described. That rate calculation establishes the **LABOR BILLING RATE** for the project by trade and classification. If a contractor or subcontractor submits documentation from their insurance company that identifies their Workmen's Compensation rate is greater than 12.5% then the multiplier of 1.40 will be adjusted to include the percentage over 12.5%. For example, an Iron Worker's Workmen's compensation percentage is 14.5%; the calculation for that Trade's LABOR BILLING RATE would become 1.42 rather than 1.40. In the case of Premium Time, Time and Half, or Double Time DCAMM will accept a multiplier of 1.40 on the premium portion of wages over the approved prevailing wage rate only. These **LABOR BILLING RATES** are inclusive of overhead, profit, and all other expenses incurred. No additional markups on labor are allowed. If a credit is due to the project a percentage of 85% of the approved labor billing rate is to be credited to the project. The **LABOR BILLING RATES** will be established for each trade and classification at the beginning of the project. If there are any disputes regarding the **LABOR BILLING RATES** they must be resolved prior to change order work being started.

2.02 Equipment Schedules and associated rates must be submitted at the beginning of the project for any contractor that anticipates renting or using equipment as part of their scope of work for approval of desired rates to be used on change orders. If the contractor cannot provide an equipment schedule, including established rates, DCAMM has elected to use *R.S. Means* to determine fair market value rates. When computing the cost of equipment the rate resulting in the lowest value (daily, weekly, monthly) is to be used. The Contractor can add 15% for overhead and profit mark up to the equipment rental cost as part of the final change order pricing. The allowance for overhead and profit shall be considered to include all additional expenses associated with hand and power tools normally required in the performance of the base bid work, "tools of the trade".

2.03 Back up for material costs is required and shall be a formal quote from the supplier providing the materials or an agreed upon industry standard determined at the beginning of the project, for example, NECA, MCCA, or Harrison. The Contractor may add 15% overhead and profit mark up to the material cost as part of the final change order pricing.

2.04 Miscellaneous Items and Services such as Police or Fire details, utility charges, and attic stock charges must be identified and estimated as part of the initial change request and back up for the cost is required. For any change that does not include labor performed, Equipment used, or materials installed in the project that results in a net increase in the contract price is considered a miscellaneous item or service. Shipping, handling and fuel surcharges must be estimated prior to orders being placed. Expedited shipping costs must be approved before an order is placed, otherwise normal shipping cost will be paid. The Contractor may add 5% for overhead and profit mark up to Miscellaneous Items and Services as part of the final change order pricing.

2.05 For changes that involve work performed by Subcontractors the Prime Contractor may add 5% markup on all subcontracted work. Subcontractors also shall be permitted to add 5% markup on all work subcontracted to Sub-tier subcontractors. Any work self-performed by either the Prime Contractor or Subcontractor is not subject to the additional 5% markup.

2.06 Travel expenses are only paid in accordance with Union Agreements or documented costs and no additional overhead and profit will be allowed on these costs. Travel will only be paid when requested on changes that result in additional time subject to the approval of the Project Manager on a case by case basis.

2.07 The General Contractor, Construction Manager, or Sub Contractor's (if applicable) bond premium shall be included at the following rates. If a Contractor's bond rate differs from this list verification from the bond carrier must be submitted showing the actual rates prior to any change order work starting on the Project.

	Contract Price	**Rates per Thousand**
(a)	Contracts up to $500,000.....	$14.40
(b)	$500,000 to $2,500,000.....	$ 8.70
(c)	$2,500,000 to $5,000,000.....	$ 6.90
(d)	$5,000,000 to $7,500,000.....	$ 6.30
(e)	$7,500,000 and up.....	$ 5.76

2.08 Changes which involve Time and Material slips must have DCAMM Daily Time and Material Reports attached, verified, and signed by the Resident Engineer or authorized representative beginning on the day the work commences, and continuing every day work occurs thereafter until the work is complete. Timesheets verifying labor hours and classification

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and invoices verifying actual material cost from vendors are required when submitting the change to substantiate all costs being billed. Costs without back up will be deducted and not reimbursed.

2.09 The Project Manager may approve lump sum change order requests on changes costing $2,000 or less, without requiring the Contractor to provide a detailed breakdown for the costs incurred on the change order. A basic level breakdown of Labor, material, and equipment on the contractors letterhead is still required.

SECTION 3. PROCESSING CHANGE REQUESTS AND EQUITABLE ADJUSTMENTS

3.01 Article VII of the Contract outlines the notification requirements for any potential change order. Time is of the essence with every potential change order and all parties, Contractors, Subcontractors, User Agency Representatives, Architect/Designer and DCAMM project team members are obligated by the Contract to expedite processing of these potential changes in an efficient and timely manner. The Prime Contractor must maintain a Potential Change Order (PCO) log for the entire project. A sample PCO log is included in the Contract Documents. The PCO log will be reviewed at each weekly Owner Meeting and have status changes updated in writing on a weekly basis.

3.02 If a request for a change has been identified, then the Prime Contractor must create a draft request for equitable adjustment referred to as a Change Order Request (COR) from their own project management system for review by the Architect/Designer and the DCAMM project team. The draft COR shall include requests for equitable adjustment from affected subcontractors, if any. The Prime Contractor's COR form must be approved in writing by the DCAMM project team prior to the first COR submission, otherwise the DCAMM Form 15 shall be used.

Each COR shall be for a specific scope of work and it shall be identified as an extra service with an explanation of reasons the change is not included in the base scope of work, such as; change in plans and specifications or other scope as outlined in Article VII. The Prime contractor shall also review each COR in accordance with Article VII of the Contract General Conditions. A COR may include multiple subcontractors for one scope of work, however all of their back up, including quotes, estimates and labor estimates must be attached to the COR for review. Having more than one COR for the same scope of work because subcontractors are late in submitting is not recommended, however there are times it is necessary. If a time extension to the contract is part of the change request, a critical path schedule from the Prime Contractor must be included in the COR. DCAMM requires all project schedules to be submitted in an electronic format as required by the Specifications of the project.

Each COR will be reviewed by the Architect/Designer, the Resident Engineer, and the Project Manager. If there is additional information required or a correction needs to be made a notification will be sent in a timely manner to the Prime Contractor with all parties copied. The Architect/Designer, Resident Engineer and Project Manager shall request any necessary additional information or corrections within 30 days of when the COR is submitted. If additional time is required to evaluate a COR, then the Contractor shall be notified within the same 30 days of the extended date by which a decision will be made. The Prime Contractor can resubmit the COR with the original COR number with an "R1" noted for the revision. This revision should be noted on the PCO log for tracking purposes and updated each time a revision is needed. No work shall begin until the COR is signed by all parties.

3.03 If the COR is complete and acceptable the Architect/Designer and DCAMM project team will advise the Prime Contractor of its acceptance consistent with section 3.05, below. Once the COR is accepted, the Prime Contractor is authorized to start the work and immediately initiate the formal Change Order ("The Gold Sheet"), Form 5, for billing purposes. Multiple signed CORs may be incorporated into one formal Change Order (Form 5) for approval: however, the original COR and all back up information must be provided. If the formal Change Order (Form 5) is incomplete or incorrect, the entire Change Order will be returned to the contractor. In such a case when multiple CORs are submitted together into one formal Change Order and the submission is either incomplete or incorrect, no single COR will be processed. Prime Contractors cannot bill for the work until a formal Change Order (Form 5) is signed by all parties and a double digit CO number is issued by the DCAMM Project Controls team. This number is to be displayed on the Schedule of Values with the change description when billing.

3.04 If the COR is not acceptable, all parties must work in good faith, and in a timely manner to resolve any issues prior to any work starting. If the issues cannot be resolved at the Project Manager or Deputy Director level within 30 days, a Project Executive from the Prime Contractor and the Director or Deputy Commissioner for Design and Construction will meet in order to reach final resolution. If the issues still cannot be resolved, the Project Manager may issue a unilateral Change Order and the Prime Contractor must commence work in accordance with Article VII of the Contract General Conditions and should refer to Article VII of the Contract General Conditions for performing work under protest and the dispute resolution process. This status will be updated on the PCO log and the Prime Contractor and DCAMM Project Team will continue to work to resolve the issues as outlined in Article VII.

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3.05 The Architect/Designer and the Resident Engineer will provide written back up, either in an email or memorandum, approving the Prime Contractor's submitted COR and Form 5 Change Order. They are not required to sign the actual form submitted. The following approvers must sign the actual Change Order for it to be a binding Contract amendment based on the delegation authority granted by the Commissioner of DCAMM:

The Director or Deputy Commissioner for Design and Construction approval shall be required whenever:

a. the estimate for the work on the Form 5's (CORs) exceeds $50,000 (absolute value); OR

b. the cumulative cost of previously approved Form 5's (CORs) exceeds five percent of the original contract award price (or the amount of the GMP amendment in the case of a Chapter 149A project) and the amount of the Form 5 (COR) being approved is greater than $2,000.00; OR

c. The change order includes a time extension.

A Deputy Director of Design and Construction shall approve change orders for DCAMM when:

a. The cumulative cost of previously approved Form 5's (CORs) is less than five percent of the original contract award price and the value of the Form 5 (COR) does not exceed $50,000.00 (absolute value).

With the prior written approval of the Director or Deputy Commissioner for Design and Construction, the Project Manager shall approve change orders for DCAMM when:

a. The cumulative cost of previously approved Form 5's (CORs) is less than five percent of the original contract award price and the value of the Form 5 does not exceed $5,000.00 (absolute value); OR

b. The estimate for the Form 5 is less than $2,000.00 (absolute value).

BILLING FOR CHANGE ORDERS PRIOR TO RECEIVING THE CHANGE ORDER NUMBER FROM THE DCAMM PROJECT CONTROLS TEAM WILL RESULT IN THE PAYMENT APPLICATION BEING REJECTED.

SECTION 4. RESPONSIBILITY FOR PROCESSING AND APPROVING CHANGES

4.01 The Prime Contractor is responsible for verifying and validating all subcontractor, vendor and supplier costs and time extensions being requested as part of any change in the work. Refer to Contract General Conditions at Article VII.

4.02 The Prime Contractor, Architect/Designer, and DCAMM project team will review all PCO, COR, and Change Orders during the weekly Owner Meetings. There may be additional time needed to approve the changes and a timeframe for resolution are to be noted in the meeting minutes and on the PCO log.

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DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

c.30, c.149, and c.149A ONLY

PROJECT NAME <project-name> **PROJECT NO.** <project-number> **P. C.** <Prime Contractor>

REQUEST FOR APPROVAL OF WAGES AND RATES FOR CHANGE ORDER PRICING

NAME OF SUBCONTRACTOR:

This form must be completed, submitted and approved prior to the submission of any change order price proposals. Complete the below for every Trade and Classification that is likely to work on the project. If any contractor seeks to utilize a total hourly wage rate (wages plus benefits) for change order pricing that is in excess of the applicable published prevailing wage rate, then this form must be completed, submitted (with backup documentation - i.e. union agreement) and approved prior to the submission of any change order price proposals. The information supplied below must be consistent with certified payroll submissions.

			Employee 1	Employee 2	Employee 3	Employee 4	Employee 5	Employee 6	Employee 7
1	Rate (Select type from drop down)	----->	Straight Time	Straight Time	Straight Time	2x Differential	1/2 Differential	Double Time	Time & Half
2	Trade Description (e.g., Carpenter, Pipefitter, Electrician, etc.)								
3	Classification (Foreman, Journeyman, Apprentice)		Journeyman	Foreman	Apprentice Step 1	Apprentice Step 3	Apprentice Step 5	Apprentice Step 7	Apprentice Step 9
4	Prevailing Wage Rate (Per Contract Specifications)								
	Subcontractor Proposed Rates For Approval								
		Rate				Premium	Premium	Premium	Premium
5	**Requested Published Rate[2] (must match certified payroll)**								
6	Enter Premium Portion of Base Rate (If Applicable)								
	O&P, Insurance, and Taxes								
7	Base Prevailing Markups[1&4] *(Multiply by Item 4 and Item 6 when applicable)*	*40.0%*	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	Workmen's Compensation Insurance Above 12.5% *(applicable to straight time only, Multiply by Item 4)*	0.00%	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Subtotal *All Inclusive Markups*	**40.00%**	$ -	$ -	$ -	$ -	$ -	$ -	$ -
9	Excess Wages/Fringes[3] *(Item 5 minus Item 4)*		$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Subcontractor Proposed Rate		$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Total Loaded Rate		$ -	$ -	$ -	$ -	$ -	$ -	$ -
	Credit Change Order Value	**85.00%**	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Effective Dates From To

The Above Total Loaded Rate Is Being Requested For Approval For Use On Change Orders Expected to Be Performed Prior To The Noted Effective Date:

ENTER EFFECTIVE DATES ABOVE BEFORE SUBMITTING FOR APPROVAL

Sub-contractor Authorized Representative

Prime Contractor Authorized Representative

DCAMM Authorized Representative

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NOTES:

1. Contractor may utilize a rate of 40% for insurance/taxes without providing documentation. If a rate in excess of 40% is requested, documentation must be provided and is only applicable to Workmen's
2. Attach all relevant supporting documentation such as union wage rate sheets and workers compensation rate tables.
3. Excess wages/fringes are those fringes required to be paid which exceed the contract prevailing wage. DCAMM will reimburse these costs, once approved, as cost only (i.e., no markups allowed). Not all excess fringe benefits are reimbursable by DCAMM. Note that the following benefits are explicitly not allowed as part of the Published Rate: Union Dues, Vacation Funds, Uniforms, Earned Sick Leave, Etc.
4. Time and a Half, Double Time, and Differential rates are calculated with 40% markup on the portion of wages above the straight time wage.

DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE				c.30, c.149, c.149A ONLY	
PROJECT NAME	<project-name>	PROJECT NO.	<project-number>	P. C. :	<Prime Contractor>
PCO NUMBER		PCO DESC.			
PCO DATE					

FORMAT FOR SUBMISSION OF CHANGE ORDER

WORK OF SUBCONTRACTOR AND/OR PRIME CONTRACTOR

NAME OF FIRM SUBMITTING CHANGE ORDER

1. DIRECT LABOR: "CONTRACTOR":

Use only DCAM-Approved Billing Rates

Applicable Billing Rate for each Trade and Classification MUST be completed!

Trade	Classification	Total Hrs. Worked	Fully Loaded Wage Rate (Per Wage Rate Approval Form) THIS FIELD IS REQUIRED	Total Direct Labor Cost (Includes All Markups as Approved by DCAMM on the Wage Rate Approval Form)
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -

TOTAL BASE, EXCESS AND DIRECT LABOR COSTS $ -

2. MATERIALS: "CONTRACTOR" :

(For extensive material lists, attach detailed backup and enter as a lump sum below)

Material Description	Qty	Unit	Cost Per Unit	Total
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -

TOTAL MATERIALS COST: $ -

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DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE				c.30, c.149, c.149A ONLY	
PROJECT NAME	<project-name>	PROJECT NO.	<project-number>	P. C. :	<Prime Contractor>
PCO NUMBER		PCO DESC.			
PCO DATE					

FORMAT FOR SUBMISSION OF CHANGE ORDER

WORK OF SUBCONTRACTOR AND/OR PRIME CONTRACTOR

NAME OF FIRM SUBMITTING CHANGE ORDER

3. **EQUIPMENT: "CONTRACTOR" :**
(For extensive equipment lists, attached detailed backup and enter as a lump sum below)

Equipment Description	Qty	Unit	Cost Per Unit	Total
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -

TOTAL EQUIPMENT COST: $ -

4. **SUB TOTAL "CONTRACTOR" DIRECT COST FOR ITEMS 2 & 3:** **SUB TOTAL:** $ -

5. **MISC. LUMP SUM SERVICES (POLICE DETAIL, UTILITIES, ETC.) OR SUBCONTRACTED WORK PROVIDED TO "CONTRACTOR":**

Description of Miscellaneous Lump Sum Service - attach backup	Total
	$ -
	$ -
	$ -
	$ -
	$ -
	$ -

TOTAL MISC. LUMP SUM SERVICES COST: $ -

6. **"CONTRACTOR" ALLOWED 5% O&P Mark Up - MISC. LUMP SUM SERVICES:** **5.00%** $ -

7. **SUB TOTAL "CONTRACTOR" LINE ITEMS 4., 5. & 6.:** **SUB TOTAL:** $ -

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DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

c.30, c.149, c.149A ONLY

PROJECT NAME	<project-name>	PROJECT NO.	<project-number>	P. C. :	<Prime Contractor>
PCO NUMBER		PCO DESC.			
PCO DATE					

FORMAT FOR SUBMISSION OF CHANGE ORDER

WORK OF SUBCONTRACTOR AND/OR PRIME CONTRACTOR

NAME OF FIRM SUBMITTING CHANGE ORDER

8. OVERHEAD AND PROFIT OF "CONTRACTOR":

The "Contractor" shall receive 15% of actual total cost of Item 4. For a net CREDIT change order amount, use 0%

Contractor 15.00% x ITEM 4: $ -

9. TOTAL OF ITEMS 1., 7. and 8.

TOTAL COST OF WORK PERFORMED BY "CONTRACTOR" : $ -

9a. CONTRACTOR PREMIUM FOR BOND

Only allowed for "Filed Sub Contractor" if required by Page "F." of the Contract. Percentage of bond per contract or verified/approved amount:

Percentage of approved bond x item 9. 0.00% x ITEM 9: $ -

10 TOTAL COST OF WORK PERFORMED BY PRIME CONTRACTOR, including bond cost $0.00

Enter the Value of Item 10 on the Summary Sheet

NOTE:

ALL change order proposals and invoices from the PRIME CONTRACTOR AND/OR SUBCONTRACTORS must include a cover letter on company letterhead identifying the PCO number, a description of the scope of work and the total cost of the proposed change order from that company. This information must be completed by every contractor doing work created by the change.

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CHANGE ORDER LOG
CONTRACT NO.: 2022-0XX
CONTRACT TITLE: JOHN SMITH PROJECT

CHANGE ORDER TYPE					DATE	INCREASE TO CONTRACT			CHANGE ORDER TYPE				AMOUNT					DATE
CO NO.	Rev. qty RQ#	Extra work EWO#	Alter-ation ALT#	Time ext. TM#	SUBMITTED to PM	co items	co subtotal	co total	Rev. qty RQ#	Extra work EWO#	Alter-ation ALT#	Time ext. TM#	Financed from contract	Funding Item	ITEM NUMBER	DESCRIPTION OF CHANGE ORDER	REASON FOR INCREASE	OF Approval
1	1																	
2-1	2																	
2-2																		
3-1	3																	
3-2																		
3-3																		
3-4																		
3-5																		
3-6																		

DIVISION OF CAPITAL ASSET MANAGEMENT & MAINTENANCE

CONTRACTOR CHANGE REQUEST NO. 0 Rev. _____

Request and Agreement For Change in The Plans And/Or Specifications And/Or Contract

Project No. _____ Contract No. _____ Project Name _____

Location _____

I. PROPOSED CHANGE

(a) Requested BY _____

(b) Proposed Scope/Description:

II. CONTRACTOR PRICE PROPOSAL

For all costs involved in this change including extensions of time herein requested, the undersigned Contractor/CM proposes to perform the work described above in accordance with the provisions of Article VII of the General Conditions and certifies that: The Change Order Request is made in good faith; The validity of the Contractor/CM/Subcontractor/supplier change requests have been verified; the supporting data is accurate and complete to the best knowledge and belief of the Contractor/CM; and the Contractor/CM actually believes DCAMM is liable for the add amount, or entitled to the deduct amount of the Change Order Request, whichever is applicable. Any attempted amendment to this form shall be interpreted as superseded by the original printed language in the executed contract documents.

Request payment be made on the basis of:

(a) _____ Predetermined lump sum total of $ _____

(b) _____ Lump sum not to exceed $ _____
(max price based on contract unit prices or negotiated agreed unit prices)

(c) _____ Time and Materials Basis Not to Exceed $ _____
(computed in accordance with Article VII of the General Conditions)

Place X beside selected proposal method and identify (add) or (deduct) which ever applies. Attach detailed estimates and breakdown for above in accordance with change order instructions. If additional time is requested, furnish an explanation with the breakdown. A claim for work performed under protest shall be submitted per (c) above.

An extension of contract time of _____ Calendar days is requested.

Contractor _____ By _____ _____
Firm Name Authorized Signature Date

III. DCAMM REVIEW *(This Section To Be Completed By DCAMM PM Team)*

(a) _____ Approved as Submitted

(b) _____ Unilaterally Approved as Adjusted
Revised Price *add / (deduct)* _____
Revised Time Extension _____ Calendar Days

(c) _____ Disapproved; Returned to Prime Contractor by _____

(d) Operating Agency letter Attached _____

(e) Resident Engineer letter Attached _____

(f) Lead Design firm letter Attached _____

IV. CONTRACT MODIFICATION *(This section To Be Completed By Project Controls)*

(a) The Original Contract Value $ _____

(b) Net Change by previously authorized Change Orders $ _____

(c) The Contract Value prior to this Change Order was $ _____

(d) The Contract Value will be *add / (deduct)* By this Change Order
in this Amount of $ _____

(e) ***The new Contract Value including this Change Order will be*** $ _____

(f) The Contract Time will be *add / (deduct)* by _____ Calendar Days

(g) The New contract Completion date is therefore revised from _____ To _____

Approval Recommended By (Initial/Date If Applicable): Deputy Director _____ Project Manager _____ Project Engineer _____

This change is in the best interest of the Commonwealth and constitutes an equitable adjustment of the Contract in compliance with Art. VII

_____ _____
DCAMM Authorized Signature Date

☐ Project Manager ☐ Deputy Director ☐ Director ☐ Deputy Commissioner

DCAMM Change Order Number _____

Form 5 REV 20191206

For DCAMM Use Only

WEEKLY PAYROLL REPORT FORM
THE COMMONWEALTH OF MASSSCHUSETTS
DEPARTMENT OF MENTAL HEALTH

DMH Project No._____Project Name_____

Project Location _____

Name of General Contractor_____

Name of Contractor Filing Report_____

Address_____

Week Ending_____Date Work Began_____Date work completed_____

Report No._____ Check here if this is a final report

Employee Name & Address	Work Classification	Hours Worked							(A) Total Hours	(B) Hourly Base Wage	Employer Contributions			(F) [B+C+D+E] Hourly Total Wage (prev.	(G) [A*F] Weekly Total Amount
		S	M	T	W	T	F	S			(C) Health & Welfare	(D) Pension	(E) Supp. Unemp.		

NOTE: Every contractor and subcontractor is required to submit a copy of their weekly payroll records to DCR.
The undersigned states under the pains & penalties of perjury that the above provided and attached information is a true and accurate record of each person employed on the project and the hours worked and wages paid to each such employee, including payments to the referenced benefits. M.G.L. c. 149 §27B.

Authorized signature _____ Print Name_____

Print Title_____

Mail to: Department of Mental Health
Mariana G. O'Brien
167 Lyman Street
Westborough, MA 01581

Weekly Payroll Report - Revised 10/01

WEEKLY PAYROLL RECORDS REPORT & STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works construction project for which the enclosed rates have been provided. The ***Weekly Payroll Report Form*** includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the project.

In addition, every contractor and subcontractor is required to submit a copy of their weekly payroll records to the awarding authority. This is required to be done on a weekly basis. Once collected, the awarding authority is also required to preserve those records for three years.

In addition, each such contractor, subcontractor, or public body shall furnish **to the Executive Office of Labor**, within fifteen days after completion of its portion of the work, a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

Date:_____/_____, 200_____

I,_____, _____
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by

_____on the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____

Title _____

PAYROLL & WORKFORCE REPORT CONTRACT NO.: 2022-0XX CONTRACT: JOHN SMITH PROJECT	Legend: ps Professional services claiming exemption io Independent oper. Claiming exemption rec DCR received dpr disputing payroll require. diss received letter of dissolution

Week ending	General Contractor		Sub-bidder #01		Sub-bidder #02		Sub-bidder #03		Sub-bidder #04		Sub-bidder #05		Sub-contractor non-filed #1		Sub-contractor non-filed #2		Sub-contractor non-filed #3		Sub-contractor non-filed #4							
	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF
9/13/2014																										
9/20/2014																										
9/27/2014																										
10/4/2014																										
10/11/2014																										
10/18/2014																										
10/25/2014																										
11/1/2014																										
11/8/2014																										
11/15/2014																										
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11/29/2014																										
12/6/2014																										
12/13/2014																										
12/20/2014																										
12/27/2014																										
1/3/2015																										
1/10/2015																										
1/17/2015																										
1/24/2015																										

PAYROLL & WORKFORCE REPORT
CONTRACT NO.: 2022-0XX
CONTRACT: JOHN SMITH PROJECT

Legend:
- ps Professional services claiming exemption
- io Independent oper. Claiming exemption
- rec DCR received
- dpr disputing payroll require.
- diss received letter of dissolution

Week ending	General Contractor		Sub-bidder #01		Sub-bidder #02		Sub-bidder #03		Sub-bidder #04		Sub-bidder #05		Sub-contractor non-filed #1		Sub-contractor non-filed #2		Sub-contractor non-filed #3		Sub-contractor non-filed #4						
	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF	PR	WF
1/31/2015																										
2/7/2015																										
2/14/2015																										
2/21/2015																										
2/28/2015																										
3/7/2015																										
3/14/2015																										
3/21/2015																										
3/28/2015																										
4/4/2015																										
4/11/2015																										
4/18/2015																										
4/25/2015																										

ESTIMATE NUMBER: XX Partial **ESTIMATE DATE:** 1/1/2021 **PERIOD:** From: 1/1/2021 to 2/1/2021

PROJECT NAME: 2022-0XX CONTRACT FULL NAME
LOCATION OF WORK: SOMEPLACE MENTAL HEALTH FACILITY
ADDRESS: STREET NAME, TOWN, STATE, ZIPCODE

CONTRACTOR: JOHN SMITH CONSTRUCTION, INC **VENDOR CODE:** VC xxxxxxx
ADDRESS: STREET NAME, TOWN, STATE, ZIPCODE

Basis of Award:	$	100,000.00	Contract Start Date:	1/1/2021
Award + Extras:	$	100,000.00	Original Completion Date:	2/1/2021
			Revised Completion Date:	2/1/2021
Utilization To-Date:	$	-	**0.00% by Value**	**100.00% by Time**
Retainage Held To-Date:	$	-	**#DIV/0!**	

CONTRACT SUMMARY

	Previous Periods	Current Period	Total To-Date
UTILIZATION:	$ -	$ -	$ -
UTILIZATION NO RETAINAGE			
ACTUAL UTILIZATION:	$ -	$ -	$ -
RETAINAGE:		$ -	$ -
RETAINAGE RELEASED:	$ -		$ -
PAID:	$ -	$ -	$ -

I HEREBY CERTIFY, UNDER THE PAINS AND PENALTIES OF PERJURY THAT ALL CONTRACT ITEMS FOR WHICH PAYMENT IS HEREBY REQUESTED HEREIN HAVE BEEN DELIVERED TO THE DCR AND ALL WORK FOR WHICH PAYMENT IS HEREBY REQUESTED HEREIN HAS BEEN PERFORMED ON THE BEHALF OF THE DCR.

Contractor signature here or AIA letter signature
CONTRACTOR/CONSULTANT AUTHORIZED SIGNATURE DATE

PROJECT ENGINEER SIGNATURE DATE

DIRECTOR, OEFM SIGNATURE (FOR FINAL PAYMENT ONLY) DATE

MMARS FUNDING CODES (as required)

PAYMENT NO.	CODE	UTILIZED	-5%

DMH CONTRACT PAYMENT REVIEW AND TRACKING FORM

Vs. 8/20/2021

PROJECT NAME: 2022-0XX CONTRACT FULL NAME
LOCATION OF WORK: SOMEPLACE MENTAL HEALTH FACILITY
PROJECT NUMBER: STREET NAME, TOWN, STATE, ZIPCODE

CONTRACTOR: JOHN SMITH CONSTRUCTION, INC

Original Contract Value: $100,000.00
Current Contract Value: $100,000.00

Notice To Proceed Date: 1/1/2021
Original Contract Completion Date: 2/1/2021
Current Completion Date: 2/1/2021
Duration: -31 Days
Current Percent Expired: 100.00%

Invoicing Details

Current Invoice No: XX Partial

	THROUGH DATE	PAID AMOUNT	RETAINAGE	UTILIZATION	%
Current Invoice	2/1/2021	$ -	$ -	$ -	0.00%
Total Prior Invoices		$ -	$ -	$ -	0.00%
Total to date	2/1/2021	$ -	$ -	$ -	0.00%

Description of work since last review

DESCRIPTION OF WORK $0.00

Contract changes and status

Amendment Description (Time, Value, etc.)	Change No.	Change in Value	% of Change	Current End Date	New Total Value	Approval Date
AWARD CONTRACT				2/1/2021	$100,000.00	1/1/2021
CO#01	1		0.0%	2/22/2021	$100,000.00	1/1/2021

Submitted by: FIRSTNAME LASTNAME, DMH PROJECT ENGINEER Date: 1/1/2021

PAYMENT SUMMARY

PROJECT NAME: 2022-0XX CONTRACT FULL NAME
LOCATION OF WORK: SOMEPLACE MENTAL HEALTH FACILITY
ADDRESS: STREET NAME, TOWN, STATE, ZIPCODE
CONTRACTOR: JOHN SMITH CONSTRUCTION, INC

start date	end date	Payment	Utilization current period	Utilization previous period	Utilization to date	5% retainage current period	retainage previous periods	retainage paid current period	retainage paid to date	retainage held to date	Paid Current Period	Previous payment Paid	Total Paid to date
1/1/2021	2/1/2021	1	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		4											
		5											
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		21											
		22											
		23											
		24											

Award + Extras:	$ 100,000.00
Utilization remaining:	$ 100,000.00

SUBMITTTAL LOG - SHOP DRAWINGS AND SAMPLES
CONTRACT NO.: 2022-0XX
CONTRACT TITLE: JOHN SMITH PROJECT

Sub-mitt NO.	DATE OF SUBMITTAL	DATE Received by PM	DATE Received by Consult.	DATE Returned by Consult.	DATE Returned by PM	Turn-around (days)	SPEC. ITEM NUMBER	DESCRIPTION OF SHOP DRAWING, SAMPLE, OR PROCEDURE WITH NAME OF VENDOR	No of pages including covers	DATE NO EXCEPTION TAKEN	DATE MAKE CORRECTIONS AS NOTED	DATE REVISE AND RESUBMIT
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
11A												

CONTRACT NO.: 2022-0XX

PROJECT NAME: John Smith Project

AGENCY: Massachusetts Department of Mental Health

REQUEST FOR INFORMATION

DATE: 00/00/2021

TO: DMH Project Engineer, first name last name

FROM: General Contractor name

RFI No.: #0xx Item or Section No - Title

REQUESTED INFORMATION:

RESPONSE:

Response prepared by (Name): _____

Signed: _____ Date: _____

RFI#0XX RFI Title

REQUEST FOR INFORMATION LOG
CONTRACT NO.: 2022-0XX
CONTRACT TITLE: JOHN SMITH PROJECT

RFI NO.	DATE OF RFI	PREPARED BY	DATE SUBMITTED by RE or update info	SPEC. ITEM NUMBER	DESCRIPTION OF REQUEST FOR INFORMATION	DATE OF RESPONSE	DESCRIPTION OF RESPONSE	Change Order No. required

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ADMINISTRATION AND FINANCE
DIVISION OF CAPITAL ASSET MANAGEMENT AND MAINTENANCE
ONE ASHBURTON PLACE, BOSTON, MA 02108

E-1 CERTIFICATE OF SUBSTANTIAL COMPLETION (M.G.L. C.30, Section 39K)

FROM AWARDING AUTHORITY: Commonwealth of Massachusetts, Division of Capital Asset Management and Maintenance

TO: General Contractor: {Company.Name}

RE: Mass. State Project No.: {Projects.Sequence} {Projects.SuffixID}
Title: {Projects.Name}
Location: {Projects.Territory}, MA

AUTHORITY: 1) ARTICLE VI of Standard Construction Contract
2) M.G.L. Chapter 30, Section 39K

Pursuant to the authority noted above you are notified that the Commonwealth of Massachusetts, through its Division of Capital Asset Management and Maintenance, is satisfied that the portion of the above noted project, as hereinafter enumerated, is substantially complete. [IDENTIFY PORTIONS TO BE USED AND/OR OCCUPIED – IF APPLICABLE]

The Commonwealth of Massachusetts, through its undersigned representatives, hereby accepts from the Contractor, subject to contract stipulation, said portion of the project effective as of Midnight the [INSERT DAY] day of [INSERT MONTH], 20[INSERT YEAR]. The Contractor is relieved of responsibility for performing further work or supplying further materials, equipment or items, with the exception of the attached. (Append a complete list of all incomplete or unsatisfactory items of contract work which in the opinion of the Commonwealth are attributable to the fault, negligence or oversight of the Contractor, his sub-contractor, material suppliers, agents, servants or employees.)

The use of any portion of the project or the occupancy of any building or portion thereof by the Commonwealth shall not constitute a final acceptance of any work not performed in accordance with the Contract, nor relieve the Contractor of liability to perform any work required by the Contract or of liabilities with respect to any warranties or guarantees required by the Contract.

The undersigned recommend the issuance of this Certificate of Substantial Completion.

		Signature	Date
Designer:	{LegalDocInfo.ArchName}	by: _____	
Operating Agency:	{LegalDocInfo.owner}	by: _____	
DCAMM Resident Engr.:	{Projects.ProjectExecutive}	by: _____	
DCAMM Project Engr.:	{Projects.ProjectExecutive}	by: _____	
DCAMM Project Mgr.:	{Projects.ProjectManager}	by: _____	

APPROVED _____
Jay Mitchell, Deputy Commissioner, Design and Construction Date

original: Operating Agency
Project Manager
Contracts Manager
Contractor (include original E1 cover letter)

ecc: Deputy Director
Project Engineer
Designer
Resident Engineer
Economist, OFA
Director of Finance, OFA
Bid Room Manager, OFA
Deputy Director, Certification

FOR DCAMM USE ONLY

E-2 Final Acceptance
Certificate of Final Inspection, Release and Acceptance

Title: _____

Location: _____

Contractor: _____

This is to certify that a complete inspection of the above-referenced project was made on _____ by the undersigned, and that the entire work was completed in accordance with the plans and specifications. The undersigned recommends acceptance of the project.

_____ by: _____ Title: _____ Date: _____
Designer Authorized
Signature

_____ _____
Resident Engineer Date Project Manager Date

_____
Project Engineer Date

CERTIFICATE OF RELEASE

1.) The undersigned hereby certifies that all work has been completed in accordance with the plans, specifications and contract documents and that all change orders have been supported pursuant to Article VII of the General Conditions of the Contract.

2.) Contract Award Price: $ Adjusted Contract Price: $
Authorized Additions: $ Paid to Date:$
Authorized Deductions:$ Balance Due: $

3.) The undersigned further certifies that in addition to the amount set forth above, there are outstanding and unsettled the following change orders as submitted to the DCR.

Request No.	Date:	Amount:
Request No.	Date:	Amount:
Request No.	Date:	Amount:

Subject to satisfactory disposition of change orders listed in Item 3 above, the undersigned releases the Commonwealth of Massachusetts from all further claims for wages or payments to subcontractors or suppliers except: (list on attached sheet).

_____ by: _____
Contractor Authorized Signature

The above-referenced project is accepted as of _____
Date

Deputy Commissioner, Engineering
Deputy Director
Project Manager
Resident Engineer
Office of Contract Administration
Contractor

CERTIFICATE OF PAYMENT

BY CONTRACTOR/DESIGNER TO MINORITY, WOMEN BUSINESS
& VETERAN OWNED BUSINESS ENTERPRISES

TO: Supplier Diversity Reports
Department of Mental Health
Office of Engineering and Facilities Management
167 Lyman Street
Westborough, MA 01581

Reporting Period: Fiscal Year 20__

RE: Project:
Project Number:

Contract Start Date:

The undersigned hereby certifies under the pains and penalties of perjury that the vendor named below has made the following payments to the named Minority, Women Business and Veteran Owned Enterprises for work performed on the above project:

Firm Name of General Contractor:

Authorized Signature

Date

Print Name

Print Title

Phone Number

Email address

Work performed/payments made (use additional pages if needed):

	Firm Name	**Work Performed**	**Subcontract Amount**	**Payments This Quarter**	**FY Payments to date** (this fiscal year 7/1/2018 - 6/30/2019)	**Cumulative Payments** (total payments over the life of the contract)
MBE WBE VOBE			$	$	$	$
MBE WBE VOBE			$	$	$	$
MBE WBE VOBE			$	$	$	$
MBE WBE VOBE			$	$	$	$
MBE WBE VOBE			$	$	$	$
MBE WBE VOBE			$	$	$	$
MBE WBE VOBE			$	$	$	$

* MBE, WBE and VOBE payment reports are required for each quarter of the fiscal year for each of your DMH projects. Reports are to cover the following three month periods: 1st quarter, July 1st – September 30th; 2nd quarter, October 1st – December 31st; 3rd quarter, January 1st – March 31st; 4th quarter, April 1st – June 30th. Reports must be submitted within 10 business days of your receipt of this form.

NOTICE: *Intentionally submitting false information in this document may subject the contractor/ designer to criminal prosecution and/ or debarment from public contracting.*

INSTRUCTIONS FOR COMPLETING CERTIFICATE OF PAYMENT

As part of its effort to ensure reliable, up-to-date information concerning the actual payments made to certified MBE, WBE and VOBE subcontractors on all DMH projects, we have prepared these instructions to assist you in completing the enclosed form. PLEASE READ THESE INSTRUCTIONS CAREFULLY. DMH WILL RETURN ANY CERTIFICATION OF PAYMENT THAT IS INCOMPLETE OR INACCURATE.

PLEASE NOTE: IF THIS PROJECT IS COMPLETE, ON HOLD, OR YOUR FIRM PREVIOUSLY SUBMITTED A **FINAL** CERTIFICATION OF M/WBE/VOBE PAYMENT FOR THIS PROJECT, PLEASE SO INDICATE ON THE FORM AND RETURN IT TO: SUPPLIER DIVERSITY REPORTS, DEPARTMENT OF MENTAL HEALTH, OFFICE OF ENGINEERING AND FACILITIES MANAGEMENT, 167 LYMAN STREET WESTBOROUGH, MA 01581

PLEASE INCLUDE THE FOLLOWING INFORMATION IN THE DESIGNATED SECTIONS OF THE FORM:

FIRM NAME: Include the M/WBE/VOBEs listed on the project's approved Schedule For Participation and any additional M/WBE/VOBEs that worked on the project. Be sure to check M/WBE/VOBE category for which they are certified. Note that any change in M/WBE/VOBEs participation used to meet the project goals must be pre-approved by the Project Manager or Engineer responsible for this project and a revised M/WBE/VOBE Schedule of Participation will be required. Contact the DMH Supplier Diversity coordinator immediately if you anticipate or have any changes in M/WBE/VOBE participation on this project.

WORK PERFORMED: Include a brief description of the work performed by each subcontractor listed. The description should match the M/WBE/VOBE Letter of Intent and approved Schedule of Participation. M/WBE/VOBEs must be certified in the category of work performed on this project for firms used to meet the project M/WBE/VOBE goals.

SUBCONTRACT AMOUNT: Include the contract or subcontract amounts listed on the M/WBE/VOBE Letters of Intent and approved Schedule of Participation. If the value of a MBE/WBE/VOBE contract or subcontract has decreased or increased for any reason, you must contact the Project Manager or Engineer responsible for this project immediately. If additional M/WBE/VOBE firms not listed on the Schedule for Participation worked on this project list the amount of their subcontracts.

PAYMENTS THIS QUARTER: Include the amount you paid the M/WBE/VOBE subcontractor, either directly or indirectly, for work performed on this project during the three month period covered by this Certification of Payment. If the amount paid was zero, please indicate that. Do not include payments from previous periods or estimated future payments in this column. Please note that you may be required to submit copies of cancelled checks to verify the amounts reported for firms used to meet the project's M/WBE/VOBE goals.

FY PAYMENTS TO DATE: Include the total amount you paid the M/WBE/VOBE subcontractor, either directly or indirectly, for work performed on this project for all quarters in **this fiscal year**. To ensure accurate reporting, please review the prior Certifications of Payments previously submitted for this project. Where necessary, correct any earlier mathematical or reporting errors and submit revised Certifications of Payment.

CUMULATIVE PAYMENTS: Include the total amount you paid the M/WBE/VOBE subcontractor, either directly or indirectly, for work performed over the entire life of this project (all quarters).

IF YOU HAVE ANY QUESTIONS CONTACT DMH Supplier Diversity coordinator.

INSTRUCTIONS FOR COMPLETING CERTIFICATE OF PAYMENT

As part of its effort to ensure reliable, up-to-date information concerning the actual payments made to certified Sub-bidder (SB), Non Sub-bidder (NSB) and Supplier (S) subcontractors on all DMH projects, we have prepared these instructions to assist you in completing the enclosed form. PLEASE READ THESE INSTRUCTIONS CAREFULLY. DMH WILL RETURN ANY CERTIFICATION OF PAYMENT THAT IS INCOMPLETE OR INACCURATE.

PLEASE NOTE: IF THIS PROJECT IS COMPLETE, ON HOLD, OR YOUR FIRM PREVIOUSLY SUBMITTED A **FINAL** CERTIFICATION OF SB/NSB/S PAYMENT FOR THIS PROJECT, PLEASE SO INDICATE ON THE FORM AND RETURN IT TO: DEPARTMENT OF MENTAL HEALTH, OFFICE OF ENGINEERING AND FACILITIES MANAGEMENT, 167 LYMAN STREET WESTBOROUGH, MA 01581.

PLEASE INCLUDE THE FOLLOWING INFORMATION IN THE DESIGNATED SECTIONS OF THE FORM:

FIRM NAME: Include the SB/NSB/S listed on the project's approved Schedule For Participation and any additional SB/NSB/Ss that worked on the project.

WORK PERFORMED: Include a brief description of the work performed listed.

SUBCONTRACT AMOUNT: Include the contract or subcontract amounts listed.

PAYMENTS THIS QUARTER: If applicable, include the amount, either directly or indirectly, for work performed on this project during the three month period covered by this Certification of Payment. If the amount paid was zero, please indicate that. Do not include payments from previous periods or estimated future payments in this column.

FY PAYMENTS TO DATE: Include the total amount you paid, either directly or indirectly, for work performed on this project for all quarters in **this fiscal year**. To ensure accurate reporting, please review the prior Certifications of Payments previously submitted for this project. Where necessary, correct any earlier mathematical or reporting errors and submit revised Certifications of Payment.

CUMULATIVE PAYMENTS: Include the total amount you paid, either directly or indirectly, for work performed over the entire life of this project (all quarters).

IF YOU HAVE ANY QUESTIONS, CONTACT DMH OFFICE OF ENGINEERING AND FACILITIES MANAGEMENT.

CERTIFICATE OF PAYMENT

BY CONTRACTOR/DESIGNER
to Sub-Bidder(s), Non-Sub-bidder(s), and Supplier(s)

TO: Department of Mental Health
Office of Engineering and Facilities Management
167 Lyman Street
Westborough, MA 01581

Reporting Period: Fiscal Year 20__

RE: Project:
Project Number:

Contract Start Date:

The undersigned hereby certifies under the pains and penalties of perjury that the vendor named below has made the following payments to the named SB, NSB, AND S companies for work performed on the above project:

Firm Name of General Contractor:

Authorized Signature

Date

Print Name

Print Title

Phone Number

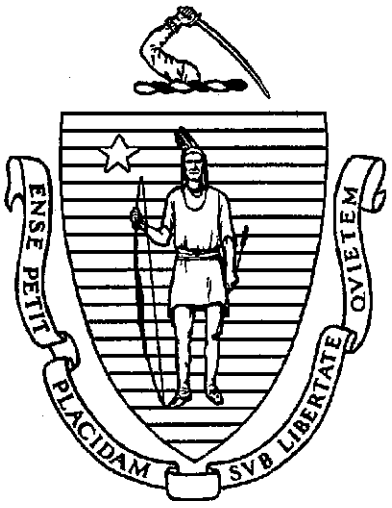
Email address

Work performed/payments made (use additional pages if needed):

	Firm Name	**Work Performed**	**Subcontract Amount**	**Payments This Quarter**	**FY Payments to date** (this fiscal year 7/1/2018 - 6/30/2019)	**Cumulative Payments** (total payments over the life of the contract)
SB NSB S			$	$	$	$
SB NSB S			$	$	$	$
SB NSB S			$	$	$	$
SB NSB S			$	$	$	$
SB NSB S			$	$	$	$
SB NSB S			$	$	$	$
SB NSB S			$	$	$	$

* Sub Bidder (SB), Non Sub-Bidder (NSB), and Supplier (S) payment reports are required for each quarter of the fiscal year for each of your DMH projects. Reports are to cover the following three month periods: 1st quarter, July 1st – September 30th; 2nd quarter, October 1st – December 31st; 3rd quarter, January 1st – March 31st; 4th quarter, April 1st – June 30th. Reports must be submitted within 10 business days of your receipt of this form.

NOTICE: *Intentionally submitting false information in this document may subject the contractor/ designer to criminal prosecution and/ or debarment from public contracting.*



BID PACKAGE

PART IV

PROJECT SPECIFICATIONS AND PLANS

DMH PROJECT #2024-067A
EMERGENCY GENERATOR REPLACEMENT
CORRIGAN MENTAL HEALTH CENTER
49 HILLSIDE STREET
FALL RIVER, MA 02720

MASSACHUSETTS DEPARTMENT OF MENTAL HEALTH

SPECIFICATIONS FOR

CORRIGAN MENTAL HEALTH CENTER
GENERATOR REPLACEMENT

January 15, 2025

SPECIFICATIONS

MGL CHAPTER 149 - DESIGN-BID-BUILD PROJECTS

TABLE OF CONTENTS

Professional Seals Page

DIVISION 01 - GENERAL REQUIREMENTS

Section 00 00 05 Professional Seals
Section 01 10 00 Summary
Section 01 31 00 Project Management and Coordination
Section 01 32 00 Construction Progress Documentation
Section 01 33 00 Submittal Requirements
Section 01 35 44 Environmental Protection Procedures
Section 01 40 00 Quality Requirements
Section 01 42 00 References
Section 01 43 25 Testing Agency Services
Section 01 50 00 Temporary Facilities and Controls
Section 01 60 00 Product Requirements
Section 01 74 18 Demolition Waste Management and Disposal
Section 01 74 19 Construction Waste Management and Disposal
Section 01 77 00 Contract Closeout

DIVISION 02 - EXISTING CONDITIONS

Section 023000 Subsurface Investigation
Section 024100 Demolition

DIVISION 03 - CONCRETE

Section 03 30 00 Cast-In-Place Concrete

DIVISION 04 - MASONRY

Not Used

DIVISION 05 - METALS

Section 05 40 00 Cold Formed Metal Framing

DIVISION 06 - WOOD, PLASTICS AND COMPOSITES

Not Used

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

Section 07 92 00 Joint Sealants

DIVISION 08 - OPENINGS

Section 08 11 13 Hollow Metal Doors and Frames

DIVISION 09 - FINISHES

Section 09 21 16 Gypsum Board Assemblies
Section 09 65 00 Resilient Flooring
Section 09 67 00 Fluid Applied Flooring
Section 09 91 23 Interior Painting

DIVISION 10 - SPECIALTIES

Not Used

DIVISION 11 - EQUIPMENT

Not Used

DIVISION 12 - FURNISHINGS

Not Used

DIVISION 14 - CONVEYING EQUIPMENT

Not Used

DIVISION 21 - FIRE SUPPRESSION

Not Used

DIVISION 22 - PLUMBING

Section 220505 Plumbing Demolition For Remodeling

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

Section 23 00 01 HVAC
Section 23 05 00 Basic HVAC Requirements
Section 23 05 05 HVAC Demolition For Remodeling
Section 23 05 16 HVAC Expansion Compensation
Section 23 05 29 HVAC Supports And Anchors
Section 23 51 00 Breechings, Chimneys, And Stacks

DIVISION 26 - ELECTRICAL

Section 26 00 01 Electrical Systems (Electrical Contractor as General Contractor)
Section 26 05 00 Basic Electrical Requirements
Section 26 05 05 Electrical Demolition for Remodeling
Section 26 05 13 Wire and Cable
Section 26 05 26 Grounding and Bonding

Section 26 05 33 Conduit and Boxes
Section 26 05 53 Electrical Identification
Section 26 05 73 Power System Study
Section 26 20 00 Service Entrance
Section 26 24 13 Switchboards
Section 26 24 16 Panelboards
Section 26 28 16 Disconnect Switches
Section 26 32 13 Packaged Engine Generator Systems
Section 26 36 00 Transfer Switch

DIVISION 27 – COMMUNICATIONS

Not Used

DIVISION 31 - EARTHWORK

Section 31 10 00 Site Clearing
Section 31 20 00 Earth Moving
Section 31 23 19 Dewatering
Section 31 25 00 Erosion and Sedimentation Controls
Section 31 50 00 Excavation Support and Protection

DIVISION 32 - EXTERIOR IMPROVEMENTS

Section 32 13 13 Concrete Paving
Section 32 92 00 Turf and Grasses

END OF TABLE OF CONTENTS

SECTION 01 10 00

SUMMARY

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Equality of material, article, assembly or system other than those named or described in this Section shall be determined in accordance with the provisions of Article V of the CONTRACT AND GENERAL CONDITIONS.

1.2 REQUIREMENTS INCLUDED

A. Work under this Contract.

B. Examination of Site and Documents.

C. General Contractor’s Qualifications.

D. Contract Method.

E. Work Sequence.

F. Supervision of Work.

G. General Contractor’s Use of Premises.

H. Coordination.

I. Field Engineering.

J. Reference Standards.

K. Preconstruction Conference.

L. Project Meetings.

M. Permits, Inspection, and Testing Required by Governing Authorities.

N. Cutting, Coring, Patching, Unless Otherwise Indicated.

O. Debris Removal.

P. Field Measurements.

Q. Safety Regulations.

R. OSHA Safety and Health Course Documentation.

S. Damage Responsibility.

T. Owner Furnished Products.

U. User Agency Occupancy.

V. Asbestos and Hazardous Materials Discovery.

W. Special Requirements.

X. List of Drawings.

1.3 WORK UNDER THIS CONTRACT

A. The work to be done under this contract consists of executing and completing all work required for this project. The scope below is listed for reference purposes and is not all inclusive.
   1. Corrigan Mental Health Center 49 Hillside St., Fall River, MA 02720
      a. Remove and replace the existing generators with an outdoor pad-mounted diesel generator. Constructing and fitting out multiple new 2-hour rated electric room/ closets for new gear for the generator distribution. Replace panel feeders, transfer switches and panels where noted. Provide new panels where noted. Provide electrical conduits and wiring as noted underground and inside building. Coordinate cutover procedures and phasing of all work.

B. The work will include all operations necessary to deliver the building(s) and ancillary on and off site amenities in a fully installed and operable condition including all utility and site work and obtaining all necessary licenses, permits, and certificates. Where utilities exist within and adjacent to the building(s) and ancillary parking lots, and are known by the Owner, they have been shown on the site plan(s) appearing in, but not restricted to, the exhibits. Connections to these existing utility lines will be the responsibility of the General Contractor.

C. The scope of work, without limiting the generality thereof, includes all labor, materials, equipment and services required to perform the work described fully in the Drawings and Specifications and includes, but is not limited to the following major work:
   1. Masonry and concrete work.
   2. Carpentry, waterproofing, dampproofing, caulking.
   3. Doors.
   4. Electrical.
   5. Sitework and exterior electrical and mechanical systems work.

6. Extension of generator exhaust stack.

D. Reference To Drawings: The work to be done under this Contract is shown on the Drawings listed at the end of this Section.

E. Work will include all demolition and new construction including underground and overhead utilities, HVAC work, plumbing work, and electrical work as required. The General Contractor will provide a schedule for completion of the project to the Owner within the required construction period.

F. The Massachusetts Standard Labor Wage rates, as outlined in the exhibits, will be used in the construction of this project.

1.4 EXAMINATION OF SITE AND DOCUMENTS

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

B. Bidders shall visit the site on 01/27/2025 at 10am for a mandatory pre-bid walkthrough to visually inspect the location of the work and existing conditions that may affect new work.

C. The bidders are expected to examine and to be thoroughly familiar with all contract documents and with the conditions under which the work is to be carried out. The Commonwealth will not be responsible for errors, omissions, and/or charges for extra work arising from the General Contractors or Subcontractors failure to familiarize themselves with the contract documents. The General Contractor and Subcontractor acknowledge that they are familiar with the conditions and requirements of the contract documents where they require, in any part of the work a given result to be produced, and that the contract documents are adequate and will produce the required results.

D. Contact:
Gerald McCullough MSME , DMH—Project Engineer
Office of Engineering and Facilities Management
Central Office
167 Lyman Street
Westborough, MA 01581
Office -508-616-2248
Cell ---617-571-5254

1.5 GENERAL CONTRACTOR'S QUALIFICATION

A. The General Contractor must be currently certified by the Division of Capital Asset Management and Maintenance (DCAMM) for Electrical Systems.

B. The General Contractor shall certify in writing that he has successfully performed on at least three new construction projects of equivalent size and complexity.

C. It is the Bidder's responsibility to obtain the necessary forms from DCAMM and make application to DCAMM not less than three weeks prior to advertised bid opening for DCAMM to evaluate the application and issue a Certificate of Eligibility.

D. The General Contractor's Updated Statement is not a public record as defined in M.G.L., Chapter 4, Section 7, and will not be open to public inspection.

1.6 CONTRACT METHOD

A. Work under this contract shall be lump sum price, for the scopes of work as described in these specifications and shown on the Drawings.

1.7 WORK SEQUENCE

A. The Work will be conducted in the following sequence of demolition/construction:
   1. Generator and Automatic Transfer Switch replacements.
      a. Work shall commence immediately following the notice to proceed.
      b. Cutover work for both the generator replacement and automatic transfer switch and downstream panel replacement must be phased to eliminate downtime of systems. Refer to electrical drawing E501 for Generator phasing.
      c. Schedule all work in coordination with equipment lead times and DMH.
   2. Shop drawings for all long lead items, including the generator, shall be submitted seven (7) calendar days after the Notice to Proceed
   3. Refer to Division 00 for substantial completion dates.

1.8 SUPERVISION OF WORK

A. The General Contractor shall be held directly responsible for the correct installation of all work performed under this Contract. The General Contractor must make good repair, without expense to the Owner, of any part of the new work, or existing work to remain, which may become inoperative on account of leaving the work unprotected or unsupervised during construction of the system or which may break or give out in any manner by reason of poor workmanship, defective materials or any lack of space to allow for expansion and contraction of the work during the General Contractor's warranty period, from the date of final acceptance of the work by the Owner.

B. The General Contractor shall furnish a competent Massachusetts licensed superintendent satisfactory to the Owner's Project Manager and to the Designer. The licensed superintendent shall supervise all work under this contract and who shall remain on duty at the site throughout the Contract period while work is in progress.

   1. Submit the name and resume of the superintendent for approval to the Owner's Project Manager. Include experience with projects of equal size and complexity.

1.9 GENERAL CONTRACTOR'S USE OF PREMISES

A. Use of the Site: Limit use of the premises to work in areas indicated within the construction space where the generator is located shown on drawing(s). Coordinate work of all Subcontractors required outside the construction fence boundary shown on the drawing(s). Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner occupancy and use by the public (if applicable).
2. Driveways and Entrances: Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

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

1. Work includes checking all safety devices to verify that they have come back on-line after interruption. This requirement will not be waived.

C. The General Contractor shall notify the Owner and Operating Agency in writing, 72 hours in advance of the proposed time for shutting down or interrupting any utilities, services or facilities which may affect the operation of other buildings, services or facilities of the Operating Agency.

D. Coordinate with the Owner and the Designer, work in connection with adjacent driveways, walks, or other facilities which would prevent access thereto or interrupt, restrict, or otherwise infringe upon the Operating Agency's use thereof.

E. The General Contractor shall be aware of the sensitivity of the neighborhood organizations to noise, dust, debris, vibration, and site maintenance and take appropriate precautions to avoid conflict.

F. Damage to existing work, if caused by the General Contractor's operations under this Contract, shall be repaired at the General Contractor's expense.

1. An existing conditions survey shall be conducted, with the Designer, the Owner's Project Manager, and User Agency representatives, at which existing conditions will be videotaped by the General Contractor. A copy of the video will be provided to the Owner's Project Manager.

G. Trenching and other work outside construction limits shall be expedited to fullest extent and carried out with minimum of inconvenience to normal operation of the Operating Agency and public traffic. Walks, paved or landscaped areas over which temporary driveways cross, shall

upon completion of the work, be restored to their original condition. Temporary roadways shall be bridged over trenched areas. Filing is required for a trench permit.

H. The General Contractor can gain access to the premises during the hours specified below. In addition, the General Contractor and his personnel will limit themselves only within the working premises during working hours. If work needs to be scheduled during times other than those listed below, General Contractor shall inform the Owner's Project Manager one week prior to work.

1. Deliveries: 7:00am to 3:00pm
2. General Access: 7:00am to 3:00pm

I. Confine operations at the site to areas permitted by:

1. Laws
2. Ordinances
3. Permits
4. Contract Documents
5. Owner's Regulations

J. If required by User Agency or the Owner's Project Manager, workers will be required to wear identifying name badges. In secure areas, submit names of workers for clearing by the Owner's Project Manager.

K. General Contractor shall supervise the use of the site related to construction and be responsible for correcting any damage identified by the Owner's Project Manager to the Owner's Project Manager's satisfaction.

1. An existing conditions survey shall be conducted, with the Designer, The Owner's Project Manager, and User Agency representatives, at which existing conditions will be videotaped by the General Contractor. A copy of the video will be provided to the Owner's Project Manager.

L. All available existing utilities adjacent to the construction site will be available for use during construction unless indicated otherwise. Temporary connections to these utilities, all metering, transformers, removal, usage, and their associated costs will be the responsibility of the appropriate Subcontractor.

M. The General Contractor shall verify that Subcontractors have visited the site and included all costs associated with the location of the project, and any restriction or limitations the location of the project may pose.

N. The Subcontractors shall at all times conduct their operations in a courteous, professional manner while on the project or in the vicinity of the project. Harassment, offensive language or behavior will not be permitted on the site.

1.10 COORDINATION

A. The General Contractor shall be responsible for the proper fitting of all the work and for the coordination of the operations of all Subcontractors or material and persons engaged upon the work. The General Contractor shall do, or cause his agents to do, all cutting, fitting, adjusting, and repair necessary in order to make the several parts of the work come together properly.

1. Examine Contract Documents in advance of start of construction and identify in writing questions, irregularities or interference to the Owner's Project manager in writing. Failure to identify and address such issues in advance becomes the sole responsibility of the General Contractor. A conflict that would cause the reduction of the normal ceiling height of any occupied space is considered to be an interference.

B. Execute the work in an orderly and careful manner with due regard to the occupants of the facility, the public, the employees, and the normal function of the facility.

C. The work sequence shall follow planning and schedule established by the General Contractor as approved by the Designer and the Owner's Project Manager. The work upon the site of the project shall commence promptly and be executed with full simultaneous progress. Work operations which require the interruption of utilities, service, and access shall be scheduled so as to involve minimum disruption and inconvenience, and to be expedited so as to insure minimum duration of any periods of disruption or inconvenience.

D. The General Contractor shall review the tolerances established in the specifications for each type of work and as established by Subcontractor organizations. The General Contractor shall coordinate the various Subcontractors and resolve any conflicts that may exist between Subcontractor tolerances without additional cost to the Owner. The General Contractor shall provide any chipping, leveling, shoring or surveys to ensure that the various materials align as detailed by the Designer and as necessary for smooth transitions not noticeable in the finished work.

1.11 FIELD ENGINEERING

A. Provide field engineering services; establish grades, lines and levels, by use of recognized engineering survey practices. All field engineering surveying shall be performed by a licensed Land Surveyor registered in the Commonwealth of Massachusetts.

B. The General Contractor shall survey and submit exact dimensional layouts as required. Engage and pay for the services of a Massachusetts Registered Surveyor acceptable to the Owner's Project Manager to locate and protect control and reference points.

1.12 REFERENCE STANDARDS

A. For products specified by association or trade standards, comply with requirements for the standard, except where more rigid requirements are specified or are required by codes. Refer to Section 01 42 00 - REFERENCES.

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

1.13 PRE-CONSTRUCTION CONFERENCE

A. In accordance with Article V of the CONTRACT AND GENERAL CONDITIONS, a pre-construction conference to review the work will be conducted by the Owner's Project Manager.

B. Representatives of the following shall be required to attend this conference:
1. Owner
2. Owner's Project Manager
3. Designer
4. General Contractor
5. All Subcontractors

C. The General Contractor shall have a responsible representative at the pre construction conference to be called by the Owner's Project Manager following the award of the contract, as well as representatives of field or office forces and major Subcontractors. All such representatives shall have authority to act for their respective firms. The pre-construction conference is to be held within five days of Notice to Proceed, or as otherwise determined by the Owner.

1.14 PROJECT MEETINGS

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

B. As a prerequisite for monthly payments, ordering schedules, shop drawing submitted schedules, and coordination meeting schedules shall be prepared and maintained by the General Contractor and shall be revised and updated on a monthly basis, and a copy shall be submitted to the Owner's Project Manager and Designer.

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

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

E. Project meetings shall be chaired by the Designer.

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

1.15 PERMITS, INSPECTION, AND TESTING REQUIRED BY GOVERNING AUTHORITIES

A. If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having any jurisdiction require any portion of the Work to be inspected, tested, or approved, the General Contractor shall give the Designer, the Owner's Project Manager or his/her designated representative, and such Authority timely notice (5 business days' minimum) of its readiness so the Designer may observe such inspecting, testing, or approval.

B. Prior to the start of construction, the General Contractor shall complete application to the applicable Building Code enforcement authority for a Building Permit. Such Permit shall be displayed in a conspicuous location at the project site.

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

D. The General Contractor shall maintain at the site, for the duration of construction operations, at least one (1) up-to-date copy of all relevant codes and standards listed in the Contract Documents or determined to be applicable to the work. One (1) copy of such codes shall be for the exclusive use of Owner's Project Manager and the Designer and its Consultants, and shall be kept in the General Contractor's site office.

E. The General Contractor shall furnish and install all information required by the building official and shall secure the general building permit for the work promptly on award of the Contract. The General Contractor shall conform to all conditions and requirements of the permit and code enforcement authority. The General Contractor shall provide names and license numbers of its responsible representatives to complete the application for permit, and shall receive the permit and promptly distribute copies to the Owner's Project Manager and the Designer.

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

1. The General Contractor shall display all permit cards as required by the Authorities, and shall deliver legible photocopies of all permits to Owner's Project Manager and the Designer promptly upon their receipt.

2. The General Contractor shall arrange for all inspections, testing and approvals required for all permits, and shall notify the Designer and Owner's Project Manager of such inspections at least three (3) business days in advance (longer if so required in the various Sections of the Specifications), so they may arrange to observe.
3. The General Contractor shall comply with all conditions and provide all notices required by all permits.
4. The General Contractor shall perform and/or arrange for and pay all testing and inspections required by the Governing Codes and Authorities, other than those provided by the Owner, and shall notify the Designer and Owner's Project Manager of such inspections at least three (3) business days in advance of all such testing or inspection, so they may arrange to observe.
5. Where Inspecting Authorities require corrective work for conformance with applicable Codes and Authorities, the General Contractor shall promptly comply with such requirements, except in cases where such requirements clearly exceed the requirements of the Contract Documents, in which case the General Contractor shall proceed in accordance with the procedures for modifications or changes in the work established in the Contract Documents, as amended.

1.16 CUTTING, CORING, AND PATCHING, UNLESS OTHERWISE INDICATED

A. The General Contractor shall coordinate all cutting, coring, fitting and patching of the work that may be required to make its several parts come together properly and fit it to receive or be received by work of the Subcontractors shown on the Drawings and Specifications. The Subcontractor shall perform all cutting, coring or patching.

B. The General Contractor shall coordinate that the work of the Subcontractor is not endangered by any cutting, coring, excavating, or otherwise altering of the work and shall not allow the cutting or altering the work of any Subcontractor except with the written consent of the Designer.

C. Submit a written request to Designer well in advance of executing any cutting or alteration which affects:

1. Work of Owner or separate Contractor.
2. Structural value or integrity of any element of the Project.
3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
4. Efficiency, operational life, maintenance, or safety of operational elements.
5. Visual qualities of sight-exposed elements.
6. Request shall include:
    a. Identification of the Project.
    b. Description of affected work.
    c. The necessity for cutting, alteration, or excavation.
    d. Effect on work of Owner or any separate General Contractor, or on structural or weatherproof integrity of Project.
    e. Description of proposed work:
    f. Alternatives to cutting and patching.
    g. Cost proposal, when applicable.

h. Written permission of any separate General Contractor whose work will be affected.

7. Should conditions of Work or the schedule indicate a change of products from original installation, General Contractor shall submit request for substitution.
8. Submit written notice to Designer designating date and time the work will be uncovered a minimum of three business days in advance.

D. Performance:

1. Execute cutting and patching by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.
   a. In general, where mechanical cutting is required, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work.
   b. Comply with the requirements of Section 31 22 00 - EARTHWORK where cutting-and-patching requires excavating and backfilling.
   c. Prior to cutting and structural steel or concrete work, contact Designer and Project Structural Engineer in writing. Do not cut any structural steel and concrete work until approval has been granted by the Designer and the Project Structural Engineer.
2. Employ original installer or fabricator to perform cutting and patching for:
   a. Weather-exposed or moisture-resistant elements.
   b. Sight-exposed finished surfaces.
3. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.
4. Restore work which has been cut or removed; install new products matching existing to provide completed Work in accordance with requirements of Contract Documents.
5. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
6. Patch with seams which are durable and as invisible as possible. Flash and seal all penetration of exterior work. Comply with specified tolerances for the work.
7. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.
   a. Where patch occurs in a smooth painted surface, extend final paint coat over the entire unbroken surface containing the patch.
8. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
   a. For continuous surfaces, refinish to nearest intersection.
   b. For an assembly, refinish entire unit.

E. Existing Utilities Services:

1. Interruptions to critical existing utility services will not be allowed.
   a. Sanitary sewer, storm drainage, and water changeovers as affecting existing services shall be done with no disruptions of existing services and scheduling of such work will require approval in writing by the User Agency.
   b. All relocation of existing electrical, telephone, and gas services that are utility company owned shall be performed by the respective utility company, and the cost of any charges for such work shall be paid by the General Contractor. All utility installations and relocation shall be the responsibility of the General Contractor.

Coordination of all of the aforesaid work is the responsibility of the General Contractor.

2. The General Contractor shall locate and record on Drawings all existing utilities along the course of the work by such means as the Designer and the Owner's Project Manager may approve, and shall preserve such marked locations until the work has progressed to the point where the encountered utility is fully exposed and protected as required. It shall be the General Contractor's responsibility to notify the proper authorities and/or utility company before interfering therewith.
3. Existing utilities that are indicated on the Drawings or whose locations are made known to the General Contractor prior to excavations, though accuracy and information as to grades and elevations may be lacking, shall be protected from damage during the excavation and backfilling operations and, if damaged by the General Contractor, it shall be repaired by the General Contractor at his/her own expense.
4. All exposed conduits, wires, and/or cables shall be provided with sufficient protection and support to prevent failure, fraying, or damage due to backfilling or other construction operations.
5. The General Contractor shall not obstruct access to existing active utility system manholes and catch basins which continue to serve facilities other than the project construction site. The General Contractor shall exercise measures as necessary to prevent the placement of impediments that limit continuous access by authorized utility company or User Agency maintenance personnel and shall be required to reimburse the utility company or User Agency for any expense incurred as a result of need to remove any such impediments to access.

F. Dig-Safe:

1. Within the Commonwealth, "Dig-Safe" (Dig Safe Systems, Inc.) is the name of the Utility Underground Plant Damage Prevention Authority. They are located at 331 Montvale Avenue; Woburn, MA 01801. The telephone number is 1-888-DIGSAFE (344-7233). General Contractors must notify "Dig-Safe" of contemplated excavation, demolition, or explosive work in public or private ways, and any utility company right-of-way easement. Notification must be made at least seventy-two (72) hours prior to the work, but not more than sixty (60) days before the contemplated work.
2. The Owner requires that notification be sent to "Dig-Safe" by certified mail with copies to the Designer and the Owner's Project Manager. The Owner requires a copy of the signed receipt of delivery.
3. "Dig-Safe" is required to respond to the notice within seventy-two (72) hours from the time said notice is received by designating at the locus the location of pipes, mains, wires, or conduits.
4. General Contractors shall not commence with work until "Dig-Safe" has responded as noted above.
5. Prior to the "Dig-Safe" notification, the Owner requires General Contractors to provide their Superintendent with current "Dig-Safe" regulations, and a copy of Massachusetts General Laws, Chapter 82, Section 40.

1.17 DEBRIS REMOVAL

A. The General Contractor shall coordinate the removal of all demolition and construction waste by the Subcontractor from the job site on a daily basis. Waste shall be segregated for recycling. Comply with requirements of Section 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

B. Debris shall be legally disposed of in a D.E.P. approved disposal site. The site to be used shall be submitted to and approved by the Owner's Project Manager prior to the start of construction. All required dumping permits shall be obtained prior to start of construction. General Contractor shall submit receipts from the disposal site(s) as evidence of legal disposal. The Subcontractor shall pay the cost of any charges for debris removal.

C. The General Contractor shall bear responsibility for maintaining the building and site clean and free of debris, leaving all work in clean and proper condition satisfactory to the Owner and the Designer. The General Contractor shall ensure that each of the Subcontractors clean up during and immediately upon completion of their work. Clean up includes the following tasks:

1. Remove all rubbish, waste, tools, equipment, appurtenances caused by and used in the execution of work.

D. Prevent the accumulation of debris at the construction site, storage areas, parking areas, and along access roads and haul routes.

E. Provide containers for deposit of debris and schedule periodic collection and disposal of debris.

F. Prohibit overloading of trucks to prevent spillage on access and haul routes.

G. The General Contractor shall be responsible for proper disposal of all construction debris leaving the site.

1.18 FIELD MEASUREMENTS

A. Although care has been taken to ensure their accuracy, the dimensions shown for existing items and structures are not guaranteed. It is the responsibility of the General Contractor to verify these dimensions in the field before fabricating any construction component. No claims for extra payment due to incorrect dimensions will be considered by the Commonwealth.

1.19 SAFETY REGULATIONS

A. This project is subject to compliance with Public Law 91 596 "Occupational Safety and Health Act" latest edition (OSHA 29 CFR 1926), with respect to all rules and regulations pertaining to construction, including Volume 36, numbers 75 and 105, of the Federal Register, as amended, and as published by the U.S. Department of Labor.

B. Submit the name of the General Contractor's safety officer to the Owner's Project Manager. Submit copies of safety reports to the Owner's Project Manager monthly.

C. All accident reports are to be transmitted to the Resident Engineer within 24 hours of occurrence.

1.20 OSHA SAFETY AND HEALTH COURSE DOCUMENTATION

A. OSHA Safety and Health Course Documentation Records: Chapter 306 of the Massachusetts Acts of 2004 requires that everyone employed at the jobsite must complete a minimum 10-hour long course in construction safety and health approved by the U.S. Occupational Safety and Health Administration (OSHA) prior to working at the jobsite. Compliance is required of General Contractors' and Subcontractors' on-site employees at all levels whether stationed in the trailer or working in the field. Unless the Massachusetts Attorney General's office indicates otherwise, this requirement does not apply to home-office employees visiting the site or to suppliers' employees who are making deliveries.

B. Documentation records shall be initially compiled by the General Contractor and Subcontractors as part of their certified payrolls, and the General Contractor shall create and maintain a copy of the documentation on site at all times. On-site documentation shall be filed in alphabetical order and immediately available to Owner's Project Manager and OSHA inspectors. Fines imposed for non-compliance shall be promptly paid by the General Contractor at no additional expense to the Owner. Delays in the progress of the Work caused by such non-compliance will not be acceptable as the basis for an extension of contract time or change order request.

1.21 DAMAGE RESPONSIBILITY

A. The General Contractor shall repair, at no cost to the Owner, any damage to building elements, site appurtenances, landscaping, utilities, etc. caused during demolition operation and work of this Contract.

1.22 OWNER FURNISHED PRODUCTS

A. Products indicated "N.I.C." (Not in Contract), or "E. O." (Equipment by Owner), or "O.F.O.I." (Owner Furnished Owner Installed), or other similar acronyms as defined in the contract documents will be furnished and installed by the Owner. Coordination and provision of service lines for such products shall be included under these Construction Contract Documents, if indicated. Final connections from service lines to equipment will be by the Owner, unless otherwise indicated

1.23 OCCUPANCY

A. Beneficial Use and Occupancy: Refer to requirements in Section 01 77 00 - CONTRACT CLOSEOUT, Par. 1.6.

B. Use and Occupancy: When the project is Substantially Complete (with all work affecting health, safety, and function totally completed, and with less than one percent (<1%) of the contract value remaining) and ready for Use and Occupancy as determined by the Designer, the Owner will take control of their building area(s) and be responsible for operating costs and security.

1.24 ASBESTOS AND HAZARDOUS MATERIALS DISCOVERY

A. If unanticipated asbestos-containing materials or other Hazardous Materials not included in Contract are discovered at any time during the course of work, the General Contractor shall cease work in the affected areas only and continue work in other areas, at the same time notify the Owner and the Designer of such discovery. Do not proceed with work in such affected areas until written instructions are received. If removal is required, payment will be made in accordance with the contract unit prices bid for each respective material. In the absence of unit prices, costs shall be negotiated or otherwise established prior to commencement of removal, in accordance with provisions of the Contract.

1.25 SPECIAL REQUIREMENTS

A. The General Contractor shall prepare a Health and Safety Plan that addresses protection of employee and public health and safety. The minimum contents of the Plan are specified in Section 01 33 00 – SUBMITTAL REQUIREMENTS.

B. The General Contractor shall be solely responsible for implementing the procedures specified in the Plan.

C. The General Contractor shall make available complete sets of personal protective equipment and clothing to the Owner for use during site observations/inspections by the Owner’s Project Manager and the Designer. These shall be supplied and maintained at no cost to the Owner, Owner’s Project Manager, or the Designer, and shall be returned to the General Contractor upon the completion of work, except for disposable protective clothing.

1. The General Contractor shall provide a repository for collection and disposal of health and safety materials. Collection and disposal of contaminated disposable supplies shall be at no additional cost.

1.26 LIST OF DRAWINGS

G000	Coversheet
A000	Architectural Coversheet
A101	First Floor Plan
A102	Second Floor Plan
M000	HVAC Coversheet
M101	HVAC – First Floor Demolition Plan
M201	HVAC – First Floor Plan
M400	HVAC Details
E000	Electrical Coversheet
ED101	Lighting – First Floor Demolition Plan
ED111	Power – First Floor Demolition Plan
ED112	Power – Second & Third Floor Demolition Plan
E201	Lighting – First Floor Plan
E202	Lighting - Second Floor Plan
E211	Power – First Floor Plan
E212	Power – Second & Third Floor Plan
E221	Systems – First Floor Plan
E222	Systems - Second Floor Plan
E300	Electrical Enlarged Plans
E400	Electrical Details
E500	Electrical Diagrams
E501	Electrical Phasing Plan
E700	Electrical Panel Schedules

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 SUMMARY

A. Without limitations, coordination will include Critical Path Method Scheduling (CPM), coordination of submittals, coordination of all elements of the Work, and coordination of contract closeout.

B. Description:

1. Coordinate scheduling, submittals, and work of the various Subcontractors and elements of the Work to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.
2. Coordinate sequence of the Work to accommodate User Agency Partial (Beneficial) Occupancy.

C. Meetings:

1. In addition to progress meetings, hold coordination meetings and pre-installation conferences with personnel and Subcontractors to assure coordination of the Work. The coordination meetings are to be separate from the commissioning or commissioning meetings.

D. Coordination of Submittals:

1. Schedule and coordinate submittals.
2. Coordinate work of various Subcontractors having interdependent responsibilities for installing, connecting to, and placing in service such equipment.
3. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and effect on work of other Subcontractors,

E. Coordinate all activities associated with commissioning activities and the work of the Test Technician.

F. Commissioning:

1. A systematic process of ensuring that all building systems perform interactively according to the Designer's design intent and the User Agency's operational needs. This is to be achieved through actual verification of systems performance during the construction period by the Owner's consultant.
2. The commissioning process does not take away from, or reduce the responsibility of, the General Contractor and installing Subcontractors to provide a finished and fully functioning product.
3. Provide all necessary documents and coordination required for the CX process to the Owner's Commissioning Agent (CA) to complete the commissioning process.

1.3 COORDINATION DUTIES

A. Coordinate the work of the Mechanical and Electrical Subcontractors:

1. For temporary utilities.
2. Among the work of the Mechanical and Electrical Subcontractors.
3. Among the work of all other Subcontractors, including the mechanical and electrical Subcontractors.

B. Coordinate the schedule of Mechanical and Electrical Subcontractors:

1. Verify timely deliveries of products for installation by other Subcontractors.
2. Verify that labor and materials are adequate to maintain schedules.

C. Participate in all project meetings:

1. Report progress of all mechanical and electrical work.
2. Recommend needed changes in schedules.
3. Transmit minutes of meetings to mechanical and electrical Subcontractors, as appropriate.
4. Commissioning meetings.

D. Temporary Utilities:

1. Coordinate installation, operation, and maintenance, to verify compliance with project requirements and with Contract Documents.

E. Shop Drawings, Product Data and Samples:

1. Prior to submittal, review for compliance with Contract Documents.
   a. Check field dimensions and clearance dimensions.
   b. Check relation to available space.
   c. Review the effect of any changes on the work of other contracts or other Subcontractors.
   d. Check anchor bolt settings.
   e. Check compatibility with equipment and work of other Subcontractors.

f. Check motor voltages and control characteristics.
g. Coordinate controls and interlocks:
   1) Voltages.
   2) Wiring of pneumatic and control diagrams.
h. Coordinate wiring and control diagrams.

F. Coordination Drawings:

1. In addition to the coordination drawings submitted by the Mechanical and Electrical Contractors, prepare additional drawings as required to assure coordination of the work, or affected by, mechanical and electrical work, or to resolve conflicts.
2. Reproduce and distribute approved copies to all concerned parties.

G. Verify that Subcontractors maintain accurate Record Documents.

H. Substitutions and Changes:

1. Review proposals and requests.
   a. Check for compliance with Contract Documents.
   b. Verify compatibility with work and equipment of other Subcontractors.
2. Recommend action to General Contractor.
3. Test materials, assemblies and/or fabrications that are submitted as substitutions, when necessary to assure that they meet contractual design standards.

I. Observe mechanical and electrical work for compliance with requirements of the Contract Documents:

1. Maintain list of observed deficiencies and discrepancies.
2. Promptly report deficiencies and discrepancies to General Contractor.

J. Assemble documentation for handling of claims or disputes involving mechanical and electrical Subcontractors.

K. Equipment Commissioning:

1. Coordinate all commissioning activities with the Owner’s commissioning agent.

L. Inspection and acceptance of equipment:

1. Prior to inspection, check that equipment is clean, repainted as required, tested and operational.
2. Assist inspector; prepare list of items to be completed or corrected.
3. Should acceptance and operation of equipment constitute the beginning of the guarantee period, prepare, and transmit written notice to the General Contractor, for his/her transmittal to the Designer and the Owner’s Project Manager for concurrence.

M. Assemble As-built documents from Subcontractors, transfer Subcontractors’ As-built documentation to electronic format, and transmit to Designer. All information shall be submitted on electronic media (CD). Drawings should be on AutoDesk AutoCAD ver. 2000 or

later, word documents in .pdf format, baseline and subsequently approved schedules in Primavera format, schedule of values in Excel format, and approved shop drawing submittals scanned in showing model numbers, capacities, and all relevant information. (Refer to Section 01 77 00 – CONTRACT CLOSEOUT for additional formatting requirements).

1. As-built documents will be compiled on compact disks and will include, without limitation, the following:
   a. All Drawings, including title sheet, code analysis, geotechnical, civil, structural, architectural, fire protection, , mechanical, electrical, security, data/telecommunications.
   b. All Specifications in .pdf format with addenda.
   c. Shop drawings and product cuts, scanned in; approved sheets only.
   d. Project schedules, baseline and all updates.

N. Oversee and provide training for the systems to be commissioned.

1. Verify that the User Agency's operating personnel are trained in each particular commissioned equipment's operation and maintenance.
2. Obtain a written sign-off, from the responsible User Agency's personnel, that certify they are capable to operate and maintain the particular commissioned equipment such that their health and safety are not compromised.
3. Verify that all training requirements meet the specified training within the particular specification divisions and the requirements of this specification section.
4. Verify that training is provided only from certified instructors. The instructors shall be certified and approved by the particular equipment manufacturer. In the absence of manufacturer's certification, the trainer shall have a minimum of ten years experience in the installation, operation, and repair of the particular equipment.
5. Verify that all training is videotaped by a professional who is regularly employed in video photography.

O. Verify that O & M documentation is complete and approved by the Designer and the Owner's Project Manager prior to transmittal to the User Agency.

1.4 COORDINATION DRAWINGS

A. Cause to be prepared and submit to the General Contractor, coordination drawings for site utilities and building(s), for Designer and the Owner's Project Manager's review.

B. Sequence of Coordination Drawings preparation shall be as follows:

1. Coordination Drawings: The General Contractor shall be fully responsible for coordinating all Subcontractors, coordinating construction sequences and schedules, and coordinating the actual installed location and interface of all work. Before materials are fabricated or the Work begun, the General Contractor shall supervise and direct the creation of one (1) complete set of Coordination Drawings showing the complete coordination and integration of all Work of this Project including, but not limited to, structural, architectural, mechanical, fire protection, and electrical disciplines. Coordination Drawings are intended to assist the General Contractor during construction

and shall not be used for “shop drawings”, “record drawings”, or any other required submittal.

a. Base Sheets: The General Contractor shall prepare and provide one accurately scaled set of building coordination drawing “base sheets” on reproducible transparencies or electronic format showing all architectural and structural work. Base sheets shall be at 1/4-inch scale, except congested areas and sections through vertical shafts shall be at 3/8-inch scale.

b. Mechanical: The General Contractor shall circulate the coordination drawings to the Mechanical Subcontractor and require the Mechanical Subcontractor to accurately and neatly show the actual size and location of all Mechanical equipment and work. The Mechanical Subcontractor shall note any apparent conflicts, suggest alternate solutions, and return the coordination drawings to the General Contractor. Sloped Mechanical lines have right of way.

c. Electrical: The General Contractor shall circulate the coordination drawings to the Electrical Subcontractor and require the Electrical Subcontractor to accurately and neatly show the actual size and location of all electrical equipment and work. The Electrical Subcontractor shall note any apparent conflicts, suggest alternate solutions, and return the coordination drawings to the General Contractor.

d. Other Subcontractors: The General Contractor shall circulate the coordination drawings to other Subcontractors whose work might conflict with other work and require these Subcontractors to accurately and neatly show the actual size and location of all their equipment and work. These Subcontractors shall note any apparent conflicts, suggest alternate solutions, and return the coordination drawings to the General Contractor.

e. After each Subcontractor completes its drawings, a meeting will be held to resolve conflicts between the Subcontractors.
    1) Coordination drawings shall be prepared at not less than 1/4-inch scale, and electronic AutoCAD files of same.
    2) Submit drawings to the General Contractor for Designer’s review prior to starting any installations.
    3) Items of impossibility or request for variance shall be called to the General Contractor’s attention for the Designer’s resolution.

f. General Contractor Review and Submission: The General Contractor shall carefully review, modify and approve coordination drawings in cooperation with the Subcontractors to assure that conflicts, if any, are resolved before work in the field is begun and to ensure that the location of work exposed to view is as indicated or as approved by the Designer and the Owner’s Project Manager.
    1) Prior to submittal of the coordination drawings, the Subcontractors shall affix their signatures to the drawings.
    2) Clearly indicate conflicts requiring modification to the general appearance or the function of the project for Designer and Owner’s Project Manager's reviews, and approvals.
    3) The General Contractor shall stamp, sign and submit the coordination drawing originals to the Designer for review and approval, with one (1) paper copy and one (1) additional electronic copy on compact disk to the Owner’s Project Manager, following the specified procedures and policies outlined in Section 01 33 00 – SUBMITTAL REQUIREMENTS. In no case shall acceptance of coordination drawings be interpreted as a release of

General Contractor of responsibility to fulfill all of the requirements of the Contract Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 REQUIREMENTS INCLUDED

A. Procedures and requirements for submission and review of progress schedules and reports.

1.3 RELATED SECTIONS

A. CONTRACT AND GENERAL CONDITIONS

1. Failure to complete the Work on time - liquidated damages.

B. Section 01 10 00 – SUMMARY

1. Project meetings.

C. Section 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

1. Progress and coordination meetings.

D. Section 01 33 00 - SUBMITTAL REQUIREMENTS

1. Project reports.
2. Schedule of values.
3. Shop drawings, product data, and samples.

E. Section 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

1. Computer equipment hardware, software, and ancillary supplies.

1.4 CONSTRUCTION SCHEDULE

A. General Contractor shall prepare and submit for Designer and the Owner’s information, a Critical Path Method (CPM) Progress Schedule for the work of the project. Said schedule will

be coordinated with the Designer's Work Plan to include sequencing of the project work (both design and construction). In addition, a Project Scheduler will be required for this project.

1. General Schedule Requirements
2. Critical Path Method (CPM) Schedule Requirements
3. Critical Path Submission Requirements
4. Critical Path Progress Reporting and Changes
5. Progress Payments to General Contractor
6. Adjustment of Critical Path Contract Completion Time

B. Critical Path Method Scheduler.

C. Design of Project.

1.5 CRITICAL PATH METHOD SCHEDULING

A. General Contractor's Schedule Requirements are contained herein, and are to be provided to the Owner by the General Contractor.

1. General Schedule Requirements
   a. Upon the finalization of the agreement, signified by issuance of the Notice to Proceed with Construction, the General Contractor shall develop a network plan to demonstrate complete fulfillment of all Working Documents and Construction contract requirements. The General Contractor shall keep the network plan up to date in accordance with the progress and logic update requirements stated herein, and shall utilize the network plan in planning, coordinating and performing the work of this project (including all activities of Designer, Subcontractors, equipment vendors and suppliers). General Contractor's monthly payments will be made in direct relation to the activity items scheduled and by the progress completion of those activities. Upon authorized commencement of the construction phase of the contract, as signified by the Notice to Proceed with Construction, the General Contractor shall provide the microcomputer, associated hardware and software required for the project site as defined under Section 01 50 00 – TEMPORARY FACILITES AND CONTROLS, Par. Computers. Substitute software, approved in writing by DMH, will be considered provided that the promised substitution is totally compatible with PRIMAVERA and all DMH software.
   b. Within 20 calendar days of receipt of the Notice to Proceed with Construction, the General Contractor shall submit to the Owner and the Designer, an expanded Time Scaled Critical Path Method (CPM) Network Diagram for the first 90 calendar days of the Construction phase of the project. This preliminary 90-day schedule need not be resource loaded.
   c. Within 60 calendar days after receipt of the DMH Notice to Proceed with Construction, the General Contractor shall submit for review by DMH and the Designer, a complete Time Scaled Critical Path Method (CPM) Network Diagram for the complete project, including all construction phases. All completion dates shall be within the period required by the contract for completion of the project. This complete duration project schedule must be fully resource loaded. The

General Contractor shall provide a presentation where the schedule's activities and logic are fully explained.

d. Within 15 calendar days after receipt of the complete Critical Path Method Network Diagram, DMH and the General Contractor shall meet with the Designer and their consultant engineers and Subcontractors, and the Project Scheduler, for joint review(s), correction, or adjustment of the proposed plan and schedule(s). Within 10 calendar days after the joint review(s), the General Contractor shall revise the proposed CPM Network Diagram in accordance with agreements reached during the joint review(s) and shall furnish two copies of the Diagram as defined hereinafter (in Para. 1.5.3), to DMH and one copy to the Designer. This CPM Network Diagram, as revised at the joint review, is the Project Schedule (and shall be the Target Schedule to which all future changes are compared) until subsequently revised in accordance with the logic update requirements stated hereinafter (in Para. 1.5.4). All appropriate Subcontractors shall also be furnished copies of the Time Scaled Network Diagram.

e. Until the joint review(s) and subsequent issuance of the complete Project Schedule, as defined hereinbefore, the establishment of the PRIMAVERA database, all Payment Requisition Schedule of Values and General Contractor Payment Forms may be produced manually.

2. Critical Path Method (CPM) Scheduling Requirements

a. The Critical Path Method (CPM) schedule shall show the sequence and interdependence of activities required and shall reflect the manner in which actual work will be performed. The number of activities shown on the Critical Path schedule must be at least equal and related to the number of items listed in the Schedule of Values, however the General Contractor must submit a detailed explanation that identifies what each activity includes. In preparing the Critical Path schedule, the General Contractor shall break up the work into activities not exceeding two calendar months each, except as to non-construction activities (i.e., design, procurement of materials and delivery of equipment) and any other activities for which DMH may approve the showing of longer duration. The schedule shall show not only the activities for actual design and construction work for each Subcontractor category of the project but also activities on which the work is dependent (i.e., such as the submittal of shop drawings, equipment schedules, samples, color submission, coordination drawings, templates, fabrication, material delivery times, Designer/DMH review and approval of design documents and shop drawings, equipment schedules, samples and templates, and the delivery of Owner furnished equipment). In addition, the complete duration project schedule submission that is to be made 60 calendar days after receipt of the DMH Notice to Proceed with Construction shall be resource loaded with costs, manpower (labor by craft or Subcontractor), and equipment for all on-site construction activities shown on the schedule. All activities shall be logically tied to one common end date. The number of construction activities shown on the Critical Path schedule shall be capable of being summarized to a level equivalent to the individual specification sections, for which any item of work is being performed (defined hereinafter in Para. 1.5.2.b). To the extent that the Critical Path schedule shows anything not jointly agreed upon, or fails to show anything jointly agreed upon, it shall not be deemed to have been accepted by DMH. Failure to include any element of work required for the performance of the contract shall not excuse the

General Contractor from completing all work required within any applicable completion date, notwithstanding DMH acceptance of the Critical Path schedule.

b. The baseline data to be entered for each individual activity shall include the duration, activity type, activity codes, work breakdown structure, date constraints, cost, resources, custom data items, predecessor activity, and successor activity.
   1) Critical Path Method (CPM) Scheduling shall be carried as a specific pay item on the Schedule of Values.
   2) Each activity shall be assigned a Work Breakdown Structure (WBS) Code. The WBS is to be structured in levels of deliverable work elements beginning with the end result (Level 1), and then divided into identifiable deliverable work elements (Level 2, 3, 4, etc.). The DMH Project Manager, Designer and General Contractor will meet to establish a WBS specific to the project.
   3) Each activity shall be assigned Activity Codes. The Activity Codes shall identify specific groups such as responsibility, phase, system, location, CSI Division, specification section, and corresponding Schedule of Values ID. This is not a complete list. The DMH Project Manager, Designer and General Contractor will meet to establish Activity Codes specific to the project.

3. Critical Path Submission Requirements (CPM Network Diagram elements)
   a. As a minimum, the General Contractor shall furnish, monthly with each Critical Path Submission, and each revision thereof required in the logic update, three (3) copies of the following PRIMAVERA output reports (which shall show Early Start, Early Finish, Late Start, Late Finish and Total Float):
      1) Current Schedule Comparison to Target Schedule
      2) Network Logic: Detailed Precedence Analysis
      3) Activity Input Listing sorted by WBS or Activity Codes, per DMH Project Manager
      4) Schedule sort by Early Start and Total Float
      5) Actual Cash, Manpower and Equipment Flows (on schedule - Monthly; late schedule - Weekly)
   b. As a minimum, the following computer-produced PRIMAVERA graphic reports shall be supplied with each Critical Path Submission and revision thereto (which shall show Early Start, Early Finish, Late Start, Late Finish and Total Float):
      1) Gantt Chart sorted by Early Start date and WBS or Activity Codes, per DMH Project Manager
      2) Bar Chart - Two Week Look Ahead sorted by WBS or Activity Codes, per DMH Project Manager (and narrative format if requested by the DMH Project Manager, at no additional cost). A two-week look ahead schedule, generated from the Project Schedule, shall be submitted for review and discussion at the weekly project meeting.
      3) Time Scaled Network Diagram (PERTVIEW) sorted by WBS or Activity Codes, per DMH Project Manager
      4) Cash, Manpower and Equipment Flows (monthly and cumulative)
   c. Payment requisition Schedule of Values (CSI formatted) and General Contractor Payment form, to be produced monthly through custom software which uses the PRIMAVERA database percentage complete to calculate payment owed to General Contractor.

d. PRIMAVERA Database: The complete PRIMAVERA database for the project shall be submitted monthly with each Critical Path Submission on a floppy disk or as otherwise requested by DMH.

e. Material/Supplies Schedule: As a minimum, a full list of all materials required for the project shall be listed. This list shall include coded sub-lists (per Para. 1.5.7) relating to the activity codes of the Critical Path Method schedule. The Material/Supplies Schedule sub-lists shall be required which list all materials required for critical activities, all items of long lead time nature (i.e., transformers, plantings, windows, doors and frames, electrical and mechanical equipment, etc.), all pre-purchase items and all Owner-furnished items. The schedule shall provide names, addresses, telephone numbers of suppliers, key suppliers' contact person, order placement data, order confirmation data, proposed arrival date, actual arrival date and all other pertinent information. This Critical Materials/Supplies Schedule and its associated sub-lists shall be updated as directed by the DMH Project Manager and as a minimum at each Logic Update period.

f. Utilities Schedule: As a minimum, a full list of all utilities required for the project shall be listed. The list shall include codes that relate to the activity code of the Critical Path schedule where appropriate. The list shall include type of utility, usage levels required, and timing of requirements.

g. Equipment Schedule: As a minimum, a full list of all equipment required for the project shall be listed. The list shall include codes that relate to the activity code of the Critical Path schedule where appropriate. The list shall include type of equipment, usage levels required, and timing of requirements.

4. Critical Path Progress Reporting and Changes (Progress and Logic Update)

a. The General Contractor shall provide a complete progress and logic update monthly. The progress and logic update shall include complete updating of the schedule progress per activity --- both amount paid and amount remaining. Actual cost amount paid and amount remaining shall agree with the payment requisition forms required hereinbefore (in sub-paragraph 1.5.3.c.). The requirements for schedule progress reporting are further specified hereinafter. A full Critical Path Submission will be required at each progress and logic update.

b. In addition to the progress and logic update requirements, the General Contractor shall prepare and submit to DMH a revised Critical Path Submission showing all changes in network logic, including but not limited to changes in activity duration, and revised activity costs as a result of contract changes in activity sequence and any changes in contract completion dates which have been made pursuant to the provisions of the contract for adjustment of contract completion time, since the last revision of the critical path schedule. The contract completion date or dates shall be adjusted to reflect time extensions granted on the activities in accordance with the contract. The contract completion date or dates shall remain constant when data in regards to actual progress (activity start, activity completion, percent completed, etc.) are entered and delay shows a negative float/slack. Where DMH has not yet made a final determination, as to the amount of time extension to be granted and the parties are unable to agree as to the amount of the extension to be reflected in the critical path schedule, the General Contractor shall reflect that amount of time extension in the critical path schedule as DMH may determine in their best judgment, to be appropriate for such interim purpose. It is understood and agreed that any such interim determination by DMH for the purposes of this paragraph shall not be binding upon either party for any other purpose and that,

after DMH has made final determination as to any time extension, the General Contractor will revise the critical path schedule prepared thereafter in accordance with the final decision, in accordance with the contract.

c. Prior to the date specified by DMH for submission of the logic update (i.e., at each General Contractor pencil monthly payment requisition, one week prior to the approval of the General Contractor monthly payment requisition), the Project Scheduler, including input from General Contractor, Subcontractors, and the Designer, shall update the computer-produced schedule and diagrams. The update shall show actual progress and percent completed of activities in progress, identify those activities started and those completed during the previous logic update period, show the estimated time required to complete each activity started but not yet completed, and reflect any changes in the critical path schedule approved in accordance with the Critical Path Scheduling Requirements and Progress and Logic Update paragraphs of this Section (Para. 1.5.2 and 1.5.4). Actual progress to-date shall be entered by inputting actual start date and remaining duration (or early finish) for each activity which has either started during the monthly update period or is ongoing. In addition to entering remaining duration, the percent complete shall be entered for that activity. However, percent complete calculation shall be set to manual using the project default screen. After completion of the review and DMH approval of all entries, the General Contractor shall submit an updated Critical Path Submission, in the detail specified in the Critical Path Submission Requirements of this Section (Para. 1.5.3), to DMH, no later than the close of business on the date specified by DMH for submission of edited General Contractor monthly payment requisition (normally one week after pencil monthly payment requisition review).

d. The General Contractor shall assume that the full duration of the contract will be required to complete the work of the contract. Positive float/slack belongs to the project and must be used in the best interest of completing the project on time in the event departure from the network occurs. If negative float/slack is indicated on the schedule, recovery schedules shall be prepared by the General Contractor at no additional cost to the Commonwealth, indicating how the work will be expedited to meet current contract completion dates. The General Contractor's construction schedule shall begin with the date of issuance of the DMH Notice to Proceed and conclude with the contract date of Final Completion of the Project. Float or slack time within the construction schedule is not for the exclusive use or benefit of either the Commonwealth or the General Contractor, but is a jointly owned, expiring project resource available to both parties as needed to meet contract milestones and the contract completion date. Therefore, any existing float shall be used to the maximum extent possible to offset:

    1) Unexpected delays which occur in connection with the General Contractor's work; and
    2) Contract change actions initiated by the parties specified in the contract (i.e., Changes in the Work).

e. Where delays are incurred, the General Contractor shall provide through weekly and/or full logic CPM update how the work delay can be returned to the approved schedule. The General Contractor agrees that whenever it becomes apparent from the current weekly computer produced calendar-dated schedule that the contract completion date will not be met, he/she will take some or all of the following actions at no additional cost to the Commonwealth:
   1) Increase design review and/or construction manpower and/or equipment in such quantities and crafts as will substantially eliminate, in the judgment of DMH, the backlog of work and any impact on the construction activities.
   2) Increase the number of working hours per shift, shifts per working day, working days per week, or the amount of construction equipment, or any combination of the foregoing, sufficiently to substantially eliminate, in the judgment of DMH, the backlog of work.
   3) Reschedule activities to achieve maximum practical concurrence of accomplishment of activities.

f. Float shall be used as it occurs (time extension granted or job delay). If a time extension and job delay occurs in the same logic update period (normally weekly), the delay will be entered in the network first.

g. In addition to the foregoing, the General Contractor shall submit a narrative report every other week (bi-weekly) and at the same time as the updated schedule required by the preceding paragraphs in a form agreed upon by DMH. The narrative report shall include a description of problem areas, current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates, and an explanation of corrective action taken or proposed.

h. DMH shall have the right to require the General Contractor to furnish additional printouts of logic updated schedules and time scaled network diagrams, reflecting actual or estimated time changes resulting from unexpected delays, change orders, strikes, etc., at no additional cost to the Commonwealth.

5. Progress Payments to General Contractor

a. The monthly Critical Path Submission shall be an integral part and basic element of the estimate upon which progress payments shall be made. The General Contractor shall be entitled to progress payment only upon approval of estimates as determined from the currently approved updated computer-produced Critical Path schedule. Payments will be made against activity items shown on the computer-produced schedule and as reflected on DMH approved format payment forms which shall be used in conjunction with PRIMAVERA. The General Contractor shall produce the Schedule of Values and the Standard Payment forms by following the guidelines of DMH staff. This shall include entering the Net Amount Paid to Subcontractors against the appropriate activities.

b. Whereas every schedule activity is cost loaded, as well as manpower and equipment loaded (i.e., the schedule of payment values lists all schedule activities, at the end of every month the General Contractor's payment application is a listing of all schedule activities started and completed, the percentage of work accomplished, and a calculation of the value of the work performed), but the Commonwealth is required to pay for work performed within a mandated time frame, the submittal of the schedule update is not a "condition precedent" to monthly progress payments; however, in the event the General Contractor fails to submit a computer-produced calendar-dated schedule or the initial or revised time

scaled network diagram on the date designated by DMH, DMH shall have the right, after giving written notice to the General Contractor, to have the computer-produced calendar-dated schedule or time scaled network diagram prepared or revised (as applicable) by separate computer contract award or otherwise and to deduct the cost thereof from the contract amount through the progress payment which becomes due upon completion thereof and upon approval of DMH of the payment request. If, however, the General Contractor fails or refuses to furnish the information and data which, in the judgment of the DMH Project Manager, are necessary for preparation or revision of the computer-produced calendar-dated schedule or time scaled network diagram by separate contract or otherwise, after seven [7] calendar days written notice, the schedule requirement terms of the contract may be considered to have been breached by the General Contractor, and DMH may take any or all of the following additional actions:

1) Impose lack-of-schedule damages (separate and distinct from liquidated damages), at a cost of $ 300 per day for every day the schedule submittal is late.
2) Terminate the contract with prejudice (per Article XVII of the Contract).

6. Adjustment of Critical Path Contract Completion Time
   a. The contract completion time or contract cost will and in general be adjusted only for change orders approved by DMH as outlined in the contract. In the event the General Contractor requests an extension of any contract completion date or cost increase he/she shall furnish such justification and supporting evidence as DMH may deem necessary for the determinations to whether the General Contractor is entitled to an extension of time or contract cost adjustment under the provisions of this contract. DMH approval as to the total number of days extension and/or increase in contract value shall be based upon the currently accepted computer-produced Critical Path schedule and on all data relevant to the extension. A request for an extension of time, associated with the change orders will not be considered unless it is clearly proven that the critical path has been negatively effected (such as, but not limited to, time impact analysis using resource loaded fragmentary networks to demonstrate the effect of delays on the overall project schedule). Such data shall be included as an activity linked to the activity which is being impacted and will appear in the next monthly schedule and logic update. All extensions for related manpower/equipment increases shall be applied to the appropriate existing activity items.
      1) Contract time can only be extended by authorized approved change order.
   b. Whereas time is of the essence in the performance of work under the contract, each request for change in any contract completion date shall be submitted by the General Contractor to DMH at the time an alleged delay occurs. Failure to notify DMH of any delay as provided in the contract shall preclude the General Contractor from subsequently claiming any damages due to said delay.
   c. For purposes of scheduling, the project will be considered to be Substantially Complete when all work affecting health, safety and function is totally completed, and with less than one [1] percent of the base contract value remaining, and ready for complete Use and Occupancy as determined by the DMH Project Manager, the Operating Agencies (individually or collectively), and the Designer. Then the User Agencies (individually or collectively) will take control of their building

area(s) and be responsible for operating costs and security. Final punch lists will be established and monetized at this time.

1) DMH Certificate of Use and Occupancy must be issued for partial Use and Occupancy, contingent upon conditions set forth by the Building Official having jurisdiction. The Massachusetts Department of Public Safety Occupancy Certificate must be issued by the effective Substantial Completion date.
2) The General Contractor shall have the number of calendar days stated in the contract, from the date of the DMH Notice to Proceed, to complete all the work before Substantial Completion is achieved. If the General Contractor fails to complete the work within the contract completion time frame so stated, the General Contractor shall be subject to the assessment of liquidated damages.

7. Additional Requirements:
   a. A list in EXCEL format and the associated database file, as prescribed by DMH, of every submittal of shop drawings, product data, samples and other submittals required by the contract, General Conditions, Supplementary Conditions and/or technical specifications of the construction contract. This required list shall be set upon a template, based on the General Contractor's Work Breakdown Structure (WBS) to facilitate reporting, showing the following: Specification Section, Sub-Section Number, Item Number, Description, Shop Drawing Number, Submittal Review and Approval, Actual Order Date, Procurement and Fabrication, Schedule Delivery Date, Date Received, Scheduled Installation Date and Actual Installation Date.
   b. A list in EXCEL format and the associated database file, as prescribed by DMH, of every long lead item required by the contract, General Conditions, Supplementary Conditions and/or technical specifications of the construction contract. This required list shall be set upon a template, based on the General Contractor's Work Breakdown Structure (WBS) to facilitate reporting, showing the following: Specification Section, Sub-Section Number, Item Number, Description, Shop Drawing Number, Submittal Review and Approval, Actual Order Date, Procurement and Fabrication, Schedule Delivery Date, Date Received, Scheduled Installation Date and Actual Installation Date.
   c. A list in EXCEL format and the associated database file, as prescribed by DMH, of every pre-purchase item required by the contract, General Conditions, Supplementary Conditions and/or technical specifications of the construction contract. This required list shall be set upon a template, based on the General Contractor's Work Breakdown Structure (WBS) to facilitate reporting, showing the following: Specification Section, Sub-Section Number, Item Number, Description, Shop Drawing Number, Submittal Review and Approval, Actual Order Date, Procurement and Fabrication, Schedule Delivery Date, Date Received, Scheduled Installation Date and Actual Installation Date.
   d. A list in EXCEL format and the associated database file, as prescribed by DMH, of every Owner-furnished item required by the contract, General Conditions, Supplementary Conditions and/or technical specifications of the construction contract. This required list shall be set upon a template, based on the General Contractor's Work Breakdown Structure (WBS) to facilitate reporting, showing the following: Specification Section, Sub-Section Number, Item Number, Description, Actual Order Date, Procurement and Fabrication, Schedule Delivery

Date, Date Received, Scheduled Installation Date and Actual Installation Date. The list of Owner-furnished items shall correspond with the construction schedule so that the submissions relate to the time when the products and/or systems will actually be required on the site.

1) Deliveries of Owner-furnished equipment or materials shall be shown on the schedule with time windows to be provided by the Commonwealth.
2) Neither the Designer nor the Commonwealth will be responsible for acceptance of a list that calls for out-of-sequence delivery of Owner-furnished items.

1.6 CRITICAL PATH METHOD SCHEDULER

A. The General Conditions and General Requirements of the construction contract apply to the General Contractor with regards to responsibility for the scheduling of all Subcontractors. The Project Scheduler shall ensure the total and complete scheduling of all work of the project as such work relates to the General Contractor's work and all Subcontractors.

B. The purpose of the Project Scheduler shall be to accurately portray all relevant activities required to complete the work according to the contract documents, organized in a logical sequence and, generally, time scaled.

C. Preferential sequencing (i.e., whereby activities that could be performed concurrently and are established in the project schedule as sequential simply to consume float), and/or indicating artificial activity durations (i.e., inflating activities in the schedule to consume float and influence the critical path) are unacceptable. The Project Scheduler will provide monthly comparisons of the start and finish dates with field records of Owner's Project Manager inspection staff, job photos, weekly meeting minutes, monthly progress reports, General Contractor weekly bar charts or two-week look ahead schedules, and accurately update the schedule to reflect actual job progress.

1. Pursuant to the float-sharing requirements of the contract documents, the use of float suppression techniques (a.k.a., sequestering float) such as preferential sequencing or logic, special lead/lag logic restraints, and extended activity times are prohibited, and the use of float time disclosed or implied by the use of alternate float suppression techniques shall be shared to the proportionate benefit of the Owner and the General Contractor.
2. Sequestering of float shall be cause for rejection of the General Contractor's schedule submittal. In the event that float sequestering is identified the General Contractor, through the Project Scheduler, shall have the computer-produced calendar-dated schedule or time scaled network diagram revised appropriately, at no additional cost to the Commonwealth.

D. The General Contractor, through the Project Scheduler, shall require the Designer, all major Subcontractors (including, but not limited to, Masonry, Plumbing, Electrical, and all other Subcontractors with a subcontract equal to or in excess of five [5] percent of the contract value) to participate in and sign off on the baseline schedule and all schedule updates. The General Contractor must submit an as-built construction schedule (certified by the General Contractor's Project Manager and the Project Scheduler as representing the way the project was actually constructed) as a condition precedent to Final Acceptance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00

SUBMITTAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 REQUIREMENTS INCLUDED

A. Shop drawings, products data, samples, submittal logs (shop drawings and samples, RFI, NOI, PCO, CO and SK drawings), weather protection (if applicable) and schedule of values.

1.3 SHOP DRAWINGS, PRODUCTS DATA, AND SAMPLES

A. General:

1. Review and submit to the Designer and where outlined below to the Owner's Project Manager, shop drawings, project data and samples required by Specifications Sections in hard and electronic copies.
2. No submissions made by FAX will be accepted.
3. The General Contractor, within the time frame stated in Section 01 32 00 – CONSTRUCTION PROGRESS DOCUMENTATION after the Pre-Construction Meeting, shall prepare and submit for the Designer and the Owner's Project Manager's approval, a Schedule of Shop Drawings, Product Data and Samples required to be submitted for the Work. The schedule shall indicate, by Subcontractor, the date by which final approval of each item must be obtained, and shall be revised as required by conditions of the Work, subject to the Owner's Project Manager's approval. The Schedule of Shop Drawings, Product Data and Samples shall correspond with the construction schedule so that the submissions relate to the time when the products and/or systems will be required on the site. Neither the Designer nor the Owner's Project Manager will approve a schedule that calls for out-of-sequence submittals.

B. Shop Drawings:

1. Original drawings shall be prepared by General Contractor, Subcontractor, Supplier or Distributor, which illustrate some portion of the Work, showing fabrication, layout, setting, or erection of details.
   a. Shop drawings shall be prepared by a qualified detailer.
   b. Details shall be identified by reference to sheet and detail numbers indicated on Contract Drawings.
   c. Maximum sheet size shall be 30-inch by 42-inch.
   d. Submit with the required number of opaque prints specified and electronic media herein.

C. Product Data:

1. Manufacturers' catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data. Provide manufacturer's catalogue sheet, specification for each product and other pertinent data as required under the individual specification.
   a. Modify product data submittals to delete information which is not applicable to the project.
   b. Supplement standard information to provide additional information applicable to the project.
   c. Clearly mark each copy to identify pertinent materials, products, or models.
   d. Show dimensions and clearances required.
   e. Show performance characteristics and capacities.
   f. Show wiring diagrams and controls.
2. All such data shall be specific and identification of material or equipment submitted shall be clearly made in ink. Data of general nature will not be accepted.
3. Product Data shall be accompanied by transmittal notice. The General Contractor's stamp of approval shall appear on the printed information itself.
4. Submit the information listed above in both hard and electronic format.

D. Samples:

1. Physical samples shall illustrate materials, equipment, or workmanship, and shall establish standards by which work is judged. After review and approval, samples may be used in construction of project if not retained for comparison
   a. Office samples of sufficient size and quantity shall clearly illustrate:
      1) Functional characteristics of product or material, with integrally related parts and attachment devices.
      2) Full range of color samples (including standard and premium ranges).
      3) After review and approval by Designer and the Owner’s Project Manager, samples may be used in construction of project if not retained for comparison.

b. Field Samples and Mock-ups
   1) Erect at project site at locations acceptable to the Designer and the Owner's Project Manager.
   2) Construct each sample of mock-up complete, including work of all Subcontractors required in finished work. Samples shall be incorporated into a larger mock-up with varied products and Subcontractors if required.

2. Unless otherwise specified in the individual Section, the General Contractor shall submit two labeled specimens of each Sample.
3. Samples shall be of adequate size to permit proper evaluation of material. Where variations in color or in other characteristics are to be expected, samples shall show the maximum range of variation. Materials exceeding the variation of the approved samples will not be approved on the Work.
4. Samples which can be conveniently mailed shall be sent directly to the Designer, accompanied by transmittal notice. On the transmittal notice the General Contractor shall stamp his approval of Samples submitted.
5. All other Samples shall be delivered at the field office of the Owner's Project Manager with Sample identification tag attached and properly filled in. Transmittal notice of Samples so delivered with the General Contractor's stamp of approval, shall be mailed concurrently to the Designer and the Owner's Project Manager to confirm their receipt thereof.
6. If Sample is rejected by the Designer, a new Sample shall be resubmitted in the manner specified herein above. This procedure shall be repeated until the Sample is approved in writing by the Designer.
7. Samples will not be returned unless return is requested at the time of submission. The right is reserved to require submission of Samples whether or not specified in the Specifications, at no additional cost to the Commonwealth.

E. Mock-ups: Erect at project site at location acceptable to Designer and the Owner's Project Manager, a mock-up complete, including work of all Subcontractors required in finished work.

1.4 GENERAL CONTRACTOR'S RESPONSIBILITIES:

A. Review shop drawings, Product Data and Samples prior to submission. Verify:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance with Specifications.
5. Integration with adjoining work.
6. Delivery schedule.
7. Is the product an equal to the product specified or a substitution? If either of these occur a comparison sheet must be submitted comparing the proposed product to the product specified.

B. All shop drawings prepared by Subcontractors shall be processed through the General Contractor. The General Contractor shall check all the shop drawings for conformity with the Contract Documents and particularly for field measurements and proper fit with adjoining work prior to submitting same to the Designer for approval. Certification shall appear on each shop

drawing stating that the General Contractor has made his/her check. Format and content of the General Contractor's certification stamp shall be subject to approval by the Owner's Project Manager and the Designer and shall include, but not be limited to:

1. The Term "By Others" shall not be used on shop drawings, the General Contractor shall state by whom related items are to be furnished and/or installed.
2. The Designer reserves the right to reject and return to the General Contractor, without examination, any shop drawings which have not been previously checked and certified as outlined above, which carry the term "by other" or such vague reference, which are difficult to read, which have arrived by FAX or which in any way are obviously not in conformity with Contract Requirements.
3. Shop drawings shall show materials, design, dimensions, connections and other details necessary to ensure that they accurately interpret the Contract Documents and shall also show adjoining work in such detail as required to provide proper connection with same.
4. The Designer will check and approve shop drawings only for conformance with the design concept and for compliance with information given in the Contract Documents. Approval of shop drawings by the Designer will not release the General Contractor from his responsibility for furnishing same of proper dimensions, size quantity and quality to effectively perform the work and carry out the requirements and intent of Contract Documents.
5. Such approval will not relieve the General Contractor from responsibility for errors of any sort in the shop drawings, nor for the proper coordination of any submittal with all other work. If the shop drawings deviate, or are intended to deviate, from the Contract Documents, the General Contractor shall so advise the Designer in writing at the time the shop drawings are submitted, stating the difference in value between the Contract requirements and that denoted by said shop drawings.
6. The General Contractor shall assume full liability for delay attributed to insufficient time for delivery and/or installation of material or performance of the work when approval of pertinent shop drawing is withheld due to the failure of the General Contractor to submit, revise, or resubmit shop drawings in adequate time to allow the Designer and the Owner's Project Manager a reasonable time, not to exceed twenty-one (21) calendar days, for normal checking and processing of each submission or resubmission.

C. Coordinate each submittal with requirements of Contract Documents.

D. The General Contractor's responsibility for errors and omissions in submittals is not relieved by the Designer's review and approval of submittals, unless Designer gives tentative written acceptance of specific deviations identified as such by the General Contractor, subject to written concurrence by the Owner's Project Manager.

E. Notify the Designer in writing at the time of submission, of deviations in submittals from requirements of Contract Documents or previous submissions.

F. Work that requires submittals shall not commence unless submitted with Designer's stamp and initials or signature indicating review and approval, and Owner's Project Manager's initials or signature of concurrence indicate review and approval.

1. No work shall be started in the shop or on the job, or materials delivered to the site, until pertinent shop drawings have been approved by the Designer and the Owner's Project Manager.

G. After aforesaid review and approval, distribute copies.

H. Maintain one (2) copies of each approved submittal at the project site. One for the General Contractor and one for the Owner's Project Manager.

1.5 SUBMISSION REQUIREMENTS:

A. General: All submittals shall be made to the Designer's Office. The quantity and make-up of submittals shall be as established by the Designer; however, two (2) additional copies of all submittals shall be transmitted to the Owner's Project Manager at the same time that such submittals are transmitted to the Designer. The Designer will log and distribute submittals for review by his consultant engineers. The General Contractor shall distribute all Civil, Structural, and MEP shop drawings directly to the Designer. All submittals shall be in both hard and electronic copies.

B. Make submittals promptly in accordance with approved schedules, and in such sequence as to cause no delay in the work.

C. Submit number of samples specified in each Section of the Specifications.

D. Submittals shall include:

1. Date and revision dates.
2. Project title and number.
3. The names of:
    a. Designer;
    b. General Contractor;
    c. Subcontractor;
    d. Supplier;
    e. Manufacturer;
    f. Separate detailer when pertinent.
4. Identification of product or material.
5. Location of work and relation to adjacent structure or materials.
6. Field dimensions clearly identified as such.
7. Specification Section number and specific paragraph under which item is specified.
8. Submission number.
9. Applicable standards, such as ASTM number.
10. A blank space, five-inch by four-inch, for the Designer's stamp.

11. General Contractor's remarks. Identify exceptions or deviations from Contract Documents and reasons for them.
    a. If shop drawings submitted by the General Contractor indicate a departure from the Contract and the Designer deems it to be minor adjustment in the interest of the Owner (subject to concurrence by the General Contractor stating it does not involve a change in Contract Price or extension of time), the Designer may approve the submission, but the approval shall be subject to Owner review and acceptance of the Designer's recommendation.
    b. The approval of the Owner shall be inferred to contain in substance the following: The change is so ordered with the understanding that it does not involve any change in the Contract Price or Time, and that it is subject generally to all contract stipulations and covenants, and is without prejudice to any and all rights of the Owner under the Contract.
12. General Contractor's stamp, initialed or signed certifying review and approval of submittal.
13. Any other items as called for by the Designer, the Owner's Project Manager or required by the manufacturers.
14. The Designer reserves the right to ask for shop drawings for any or all items on the project, whether or not requested in individual specification sections, at no additional cost to the Commonwealth.

1.6 RESUBMISSION REQUIREMENTS:

A. Resubmission: Resubmission procedure shall follow the same procedures as the initial submittal with the following exceptions:

B. Shop Drawings:

1. Transmittal shall contain the same information as the first transmittal except that the submission number shall change sequentially. The drawing number/description shall be identical as the first transmittal but the date shall be the revised date for that submission.
2. No new material should be included on the same transmittal for the resubmission.
3. Indicate on drawings any changes which may have been made other than those requested by the Designer.

C. Product Data and Samples:

1. Submit any new data and samples as required from previous submittal.

1.7 THE OWNER'S PROJECT MANAGER'S AND DESIGNER'S REVIEWS AND DISTRIBUTION OF SUBMISSIONS

A. The Owner's Project Manager and/or his/her designees will review submittals concurrently with the Designer and his/her consultant engineers. The Designer and the Owner's Project Manager shall communicate within the aforesaid review period time frame (21 calendar days). The time frame for the Designer's review will not exceed fourteen (14) calendar days between her/his

receipt of submittal and contacting the Owner's Project Manager. After the Designer's (and his/her consultant engineers) review, distribution shall be as stated herein.

1. If submittal is 'reviewed - no exceptions taken', or 'reviewed, make corrections noted', the Owner's Project Manager shall compose a transmittal indicating the status. The Owner's Project Manager will then return one (1) copy of the submittal together with the transmittal to the Designer, and shall retain one (1) copy for her/his records. The Designer shall copy and attach the Owner's Project Manager's transmittal to each submittal, stamp the submittals in concurrence with the status agreed to, and transmit back to the General Contractor. The General Contractor shall then distribute said submittals to appropriate Subcontractors.
2. If submittal is 'reviewed - revise and resubmit' or 'rejected', the Owner's Project Manager shall compose a transmittal indicating the status. The Owner's Project Manager will then return one (1) copy of the submittal together with the transmittal to the Designer, and shall retain one (1) copy for her/his records. The Designer shall copy and attach the Owner's Project Manager's transmittal to each submittal, stamp the submittals in concurrence with the status agreed to, and transmit back to the General Contractor for resubmission. A copy of the transmittal, indicating that a submittal was disapproved and returned to the General Contractor, will be forwarded from the Designer to the Owner's Project Manager with an additional copy forwarded from the Designer to the Owner's Resident Engineer, for their records.
3. If a submittal is 'reviewed - no exceptions taken' or reviewed, make corrections noted' by the Designer, or approved as noted by the Designer, but the Owner's Project Manager does not concur, a meeting between the Designer and the Owner's Project Manager will immediately be established to resolve the impasse within the overall review period time frame (21 calendar days). The Owner's Project Manager will have final authority as to the disposition of the submission. The Designer's position of approval (or disapproval) must be based on the contractual criteria of design intent, function, structure, and durability. The Owner's Project Manager's contrary position must also be based on these criteria.
4. The combined review period, for the Designer and the Owner's Project Manager, will not exceed twenty-one (21) calendar days from the established date of each submission indicated on the Schedule of Shop Drawings, Product Data and Samples, plus the additional time, if any, for distribution by the General Contractor and receipt of submissions by the Designer and Owner's Project Manager. The General Contractor is required to anticipate review time, including time for possible rejection and resubmission, in establishing Schedule dates.
    a. The aforementioned time provided the Designer for checking shop drawings is from the date of receipt of shop drawings by the Designer to the mailing date of shop drawings returned to the General Contractor by the Designer.
5. The Designer will process the submission and indicate the appropriate action on the submission and the transmittal. Incomplete or erroneous transmittals will be returned without action.
6. The Designer will fill out transmittal in the following sequence:
    a. Date received from General Contractor.
    b. Date forwarded to Owner's Project Manager.
    c. Date received from Owner's Project Manager.
    d. Date returned to General Contractor.
    e. Action taken on submission.

f. Distribution, including number of copies distributed and type of material distributed (i.e., print, brochure or sample, etc.).
g. Designer's remarks (note major deviations from the Contract Documents).

B. Designer's Review Procedure:

1. Stamped REVIEWED, "NO EXCEPTIONS TAKEN":
   a. No corrections or resubmissions required; fabrication may proceed.
2. Stamped REVIEWED, "MAKE CORRECTIONS NOTED":
   a. If General Contractor complies with noted corrections, fabrication may proceed. Submit corrected print for final review.
   b. If, for any reason, the General Contractor cannot comply with the noted corrections, fabrication shall not proceed and General Contractor shall resubmit, following procedures outlined in this Section.
3. Stamped REVIEWED, "REVISE AND RESUBMIT" OR "REJECTED":
   a. General Contractor shall revise and resubmit for review. Fabrication shall not proceed.

C. Manufacturer's Instruction

1. When required in individual Specification Section, submit manufacturer's printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing, in quantities specified for product data., with two (2) additional copies submitted to the Owner's Project Manager.

D. Certificates of Compliance: Submit certificates of compliance with the associated Shop Drawings, Product Data, and Samples required for the product in quantities specified for certificates of compliance, with two (2) additional copies submitted to the Owner's Project Manager.

E. Field Samples: Provide field samples of finishes at the project as required by individual Specification Section. Install sample complete and finished.

F. Patterns and Colors: Submit accurate color charts and pattern charts to the Designer for review and selection whenever a choice of color or pattern is available in a specified product, unless the exact color and pattern of a product are indicated in the Contract Documents. Color and Pattern charts shall represent the manufacturer's complete standard offerings, except where Specifications limit the offerings by defining a particular series or product type which is normally limited in color and pattern availability. Color and Pattern charts shall be submitted in quantities specified with two (2) additional copies submitted to the Owner's Project Manager.

1.8 SCHEDULE OF VALUES

A. Prior to the first request for payment, the General Contractor shall submit to the Designer and the Owner's Project Manager, a Schedule of Values of the various portions of the Work in sufficient detail to reflect various major components of each Subcontractor, including quantities when requested, aggregating the total contract sum, and divided so as to facilitate payments for work under each Section. The schedule shall be prepared in such form as specified or as the

Designer or the Owner’s Project Manager may approve, and it shall include data to substantiate its accuracy. Each item in the Schedule of Values shall include its proper share of overhead and profit. This schedule, including breakdown and values, requires the approval of the Designer and the Owner’s Project Manager and shall be used only as a basis for the General Contractor's request for payment

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 35 44

ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 – GENERAL REQUIREMENTS that are hereby made a part of this Section of the Specifications.

1.2 SUMMARY

A. Furnishing all labor, materials, and equipment and perform all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operation under this Contract. For the purpose of this Section, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires consideration of air, water, and land, and involves management of runoff, dust, noise, and solid waste, as well as other pollutants. Work shall include installing, maintaining, and removing sedimentation and erosion control components within the Limits of Work.

1.3 SECTION INCLUDES

A. Applicable Regulations.

B. Notifications.

C. Protection of Groundwater.

D. Protection of Land Resources

E. Protection of Air Quality

F. Maintenance of Pollution Control Facilities During Construction.

G. Noise Control.

H. Diesel Equipment Emission Controls.

I. Spill And Discharge Control.

1.4 RELATED SECTIONS

A. Section 01 50 00 - TEMPORARY FACILITIES AND CONTROLS:

B. Section 02 41 00 - DEMOLITION:

1.5 APPLICABLE REGULATIONS

A. The General Contractor shall comply with all applicable Federal, State and local laws and regulations concerning environmental pollution control and abatement.

B. Fines and related costs resulting from failure to provide adequate protection against any environmentally objectionable acts and corrective action to be taken are the obligations of the General Contractor.

1.6 NOTIFICATIONS

A. The OPM may notify the General Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements may notify the General Contractor in writing, through the OPM, of any non-compliance with State or local requirements. After receipt of such notice from the OPM or from the regulatory agency through the OPM, the General Contractor shall immediately take corrective action. Such notice, when delivered to the General Contractor or his/her authorized representative at the site of the Work, shall be deemed sufficient for the purpose. If the General Contractor fails or refuses to comply promptly, the OPM may issue an order stopping all or part of the Work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the General Contractor unless it is later determined that the General Contractor was in compliance.

PART 2 - PRODUCTS

2.1 WATER

A. Water used for dust control and equipment washes shall be clean and free of salt, oil, and other injurious materials. The General Contractor shall provide all necessary water.

2.2 ONSITE SPILL KIT

A. The General Contractor shall provide the following minimum equipment to be kept onsite at all times during site work activities for any unexpected spills or discharges:

1. Sand, clean fill and absorbent pillows,
2. Four drums (55 gallon, U.S. DOT 17-E or 17-H),
3. Shovels, and
4. Steam cleaner for decontamination of tools and equipment.

PART 3 - EXECUTION

3.1 PROTECTION OF GROUNDWATER

A. Care shall be taken to prevent, or reduce to a minimum, any discharges to the ground of liquids that may infiltrate to the underlying groundwater or enter on-site waterways. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the groundwater or waterway shall not be discharged from the Site. Such waters shall be collected and disposed of by the General Contractor in accordance with all applicable Federal, State and local regulations.

3.2 PROTECTION OF LAND RESOURCES

A. Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of remediation activities that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to Limits of Work areas shown on the Drawing.

B. Outside of the Limits of Work as shown on the Drawing, do not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. Snow fence or other approved equal shall be erected at the “fall line” of the tree canopy, and no vehicles or storage will be permitted within, to prevent damage to trees.

C. The locations of storage and other facilities, required in the performance of the Work, shall not be within wetlands or resource areas.

3.3 PROTECTION OF AIR QUALITY

A. Burning – The use of burning at the project site for the disposal of refuse and debris will not be permitted.

B. Dust Control – Maintain all demolition excavations, stockpiles, waste areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded (MADEP 310 CMR 7.09.-7.10) and which would cause a hazard or nuisance to others.

C. The General Contractor shall provide adequate means for the purpose of preventing dust and odor caused by construction operations throughout the period of the construction contract. If DCAMM or the Designer indicates that the level of dust or odors is unacceptable, the General Contractor shall employ measures necessary to reduce dust or odors to an acceptable level.

D. The General Contractor shall implement engineering controls (e.g. watering, misting) to control dust whenever required by the Designer or DCAMM.

3.4 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this Contract, maintain all facilities constructed for pollution, erosion, and sedimentation control as long as the operations creating the particular pollutant area being carried out.

3.5 NOISE CONTROL

A. The General Contractor shall develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum. Local noise ordinances shall govern.

B. The General Contractor shall execute construction work by methods and by use of equipment which will reduce excess noise.

C. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with Federal and State regulations.

D. The General Contractor shall manage vehicular traffic and scheduling to reduce noise.

3.6 DIESEL EQUIPMENT EMISSION CONTROLS

A. All motor vehicles and construction equipment shall comply with all pertinent local, state, and federal regulations covering exhaust emission controls and safety.

B. All General Contractor and Subcontractor diesel-powered non-road construction equipment with engine horsepower (HP) ratings of 50HP and above, which are used on the Project Site for a period in excess of 30 calendar days over the course of the construction period on the Project Site, shall be retrofitted with Emission Control Devices in order to reduce diesel emissions.

C. The reduction of emissions of volatile organic compounds (VOCs); carbon monoxide (CO) and particulate matter (PM) from diesel-powered equipment shall be accomplished by installing Retrofit Emission Control Devices.

D. Acceptable Retrofit Emission Control Devices for the Project shall consist of oxidation catalysts or other comparable technologies that are (1) included on the US Environmental Protection Agency (EPA) *Verified Retrofit Technology List* and/or the California Air Resources Board *Currently Verified Technologies List*; and (2) are verified by EPA or CARB, to provide a minimum emissions reduction of 50 percent for VOCs, 40 percent for CO and 20 percent for PM. Attainment of the required reduction in PM emissions can also be accomplished by using less polluting Clean Fuels. Verified technologies can be identified on the following websites:

EPA: http://www.epa.gov/otaq/retrofit/retroverifiedlist.htm

CARB: http://www.arb.ca.gov/diesel/verdev/verifiedtechnologies/cvt.htm

E. The emission control equipment can be procured through the Statewide Contract #VEH71 that has fixed costs associated with retrofitting of diesel emission control devices.

F. Construction shall not proceed until the General Contractor has submitted a certified list of the non-road diesel-powered construction equipment subject to this specification which either are or will be retrofitted with emission control devices. The list shall include (1) the equipment number, type, make, and General Contractor/Subcontractor name; and the emission control device make, model, and EPA verification number. General Contractors shall also submit a receipt or other documentation from a manufacturer or installer that verifies that appropriate equipment has been installed. The General Contractor shall also identify any vehicles that will

use Clean Fuels. Equipment that has been retrofitted with an emission control device shall be stenciled or otherwise clearly marked as "Low Emission Equipment".

G. The General Contractor shall submit monthly reports, updating the same information stated in Paragraph F above, including the quantity of Clean Fuel utilized. The addition or deletion of non-road diesel equipment shall be indicated in the report.

H. The General Contractor shall use methods to control nuisance odors associated with diesel emissions from construction equipment including but not limited to the following: (1) turning off diesel combustion engines on construction equipment not in active use and on trucks that are idling for five minutes or more; and (2) locating diesel equipment away from the general public and sensitive receptors.

I. All costs associated with implementation of the diesel equipment emissions control shall be borne by the respective General Contractor or Subcontractor and included in their cost for performing the work of the Contract.

3.7 SPILL AND DISCHARGE CONTROL

A. The General Contractor shall provide equipment and personnel to perform emergency measures required to contain any spillage and to remove spilled materials and soils or liquids that become contaminated due to spillage. The collected spill material shall be properly disposed of at the General Contractor's expense.

B. Costs to provide the above spill and discharge control materials shall be included in the contract base bid price.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 REQUIREMENTS INCLUDED

A. General Contractor’s Quality Assurance.

B. General Contractor’s Testing Responsibilities.

C. Owner’s independent agencies.

D. Duties of the General Contractor’s testing agencies.

E. Welding.

F. Field engineering.

G. Examination of substrate.

H. General Contractor’s Quality Assurance and Quality Control Plan.

1.3 RELATED SECTIONS

A. Section 01 31 00 – PROJECT MANAGEMENT AND COORDINATION:

1. General project management and coordination.

B. Section 01 43 25 – TESTING AGENCY SERVICES:

1. Testing to be performed by the Owner’s Independent Testing Laboratory, exclusive of testing to be performed by the General Contractor.

1.4 GENERAL CONTRACTOR'S QUALITY ASSURANCE

A. Qualifications for Service Agencies: Engage inspection and testing services agencies, including independent testing laboratories, which are pre-qualified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.

B. Each independent inspection and testing agency engaged on the project shall be authorized by authorities having jurisdiction to operate in the Commonwealth of Massachusetts.

1.5 GENERAL CONTRACTOR'S TESTING RESPONSIBILITIES

A. The General Contractor shall provide inspections, tests and quality control services specified in individual specification Sections and required by governing authorities, except where they are specifically indicated to be solely the responsibility of a Subcontractor in the respective specification section or solely the responsibility of Owner.

B. Engage and pay for the services of an independent agency acceptable to the Owner's Project Manager to perform the specified inspections, testing, and quality control. Submit qualifications to the Owner's Project Manager. General Contractor's testing agency/laboratory shall be licensed by the Commonwealth of Massachusetts Department of Public Safety.

C. Re-testing: The General Contractor is responsible for re-testing where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Documents requirements, regardless of whether the original test or service was the General Contractor's responsibility.

D. Substitutions, Suspicious Issues and Designer Initiated Testing: The General Contractor is responsible for inspections, tests and similar services for substitutions, suspicious issues identified by the General Contractor or Owner's Project Manager, and testing initiated by the Designer.

E. Associated Services: The General Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as required. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:

1. Provide access to the work and furnish incidental labor and facilities necessary to facilitate inspections and tests.
2. Take adequate quantities or representative samples of materials that require testing or assist the agency in taking samples.
3. Provide facilities for storage and curing of test samples and delivery of samples to testing laboratories.
4. Provide the agency with a preliminary design mix proposed for use for material mixes that require control by the testing agency.
5. Provide security and protection of samples and test equipment at the project site.

F. The General Contractor shall prepare and submit to the Owner's Project Manager for approval a Quality Assurance and Quality Control Plan within 30 days from Notice to Proceed. A Quality Assurance and Quality Control (QA/QC) Plan shall promote completion of all work in accordance with the Contract Documents including Contract, Construction Drawings, Specifications, Project Procedures, Approved Submittals and Shop Drawings, Approved Changes, Applicable Codes and Regulations, Referenced Industry Standards, and similar items. The primary purpose of this quality plan is to ensure that all in place work by the General Contractor and all Subcontractors is performed correctly the first time and is turned over and represented as complete and defect free in accordance with the Contract Documents.

G. If required by the Contract, the General Contractor shall assign a dedicated Quality Assurance and Quality Control Manager for the duration of the project. If the Contract does not require a dedicated Quality Assurance and Quality Control Manager, the General Contractor shall prepare and submit to the Owner's Project Manager their QA/QC Plan as discussed in Par. E above. In addition, if this Contract does not require a dedicated QA/AC Manager, the duties of the QA/AC Manager as delineated in Par. 1.5F6 shall be carried out by another qualified member of the General Contractor's onsite staff.

1. The purpose of a QA/QC Manager shall be to prepare and submit the Quality Assurance and Quality Control Plan for approval and to be responsible for and to manage adherence to the plan throughout the construction process. The QA/QC Manager shall be designated for the project from the initial notice to proceed through system acceptances by both the designer and Owner's Project Manager. The QA/QC Manager shall at all times instill an expectation that all work will be completed correctly and in an expeditious manner and shall be responsible for enforcement of the General Contractor's Staff and all Subcontractors to this plan.
2. Have extensive experience in building construction, project controls, and previous QA/QC training and practical knowledge.
3. Have excellent communication and writing skills, be highly organized and be able to work with both management and Subcontractors.
4. Have a working knowledge of project scheduling.
5. The General Contractor shall submit substantiating documentation attesting to the proposed QA/QC Manager's capabilities to the Owner's Project Manager and the Designer for approval.
6. Duties of the QA/QC Manager:
    a. Prepare and submit QA/QC Plan for approval.
    b. Conduct and submit minutes for all requisite Quality Meetings.
    c. Coordinate and report on all daily quality activities.
    d. Verify accurate documentation by Subcontractors and Vendors.
    e. Work with Commissioning Agent.
    f. Oversee final project records pertaining to quality.
    g. Report, photograph and distribute evidence of deficient and/or defective construction conditions or materials that cannot be corrected within three work days of observation. When such conditions or materials are remedied report, photograph and distribute evidence of remedial work prior to concealing. Photographs shall be dated and defects and/or deficiencies shall be clearly labeled on the photographs.

1.6 OWNER'S INDEPENDENT TESTING AGENCIES

A. The Owner may choose to engage an independent testing agency at its own expense to perform certain tests and similar services as set forth in Section 014325. Information provided by the Owner's Independent Testing Agency shall be for the sole use of Owner's Project Manager, and shall not relieve the General Contractor of its responsibilities to provide its own quality control, to meet all requirements of the Contract and to provide a completed project free from construction defects.

B. It is the General Contractor's responsibility to provide and pay for its own inspection and testing to assure quality control. General Contractor shall be responsible for coordinating its work with requirements of the Owner's testing agencies, and shall provide reasonable services in support of facilitating work of Owner's testing agencies as required.

1.7 DUTIES OF THE GENERAL CONTRACTOR'S TESTING AGENCIES

A. The General Contractor's independent testing agency engaged to perform inspections, sampling and testing of materials and construction shall cooperate with the Designer and General Contractor in performing its duties, and shall provide qualified personnel to perform required inspections and tests.

B. The testing agency shall notify the Designer and General Contractor promptly of irregularities or deficiencies observed in the work during performance of its services.

C. The testing agency shall not perform any duties of the General Contractor.

D. The General Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.8 GENERAL CONTRACTOR'S QUALITY CONTROL REQUIREMENTS, GENERAL

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of the quality as specified.

B. Comply fully with manufacturer's instructions, including each step in sequence.

C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortions, or disfigurement. Anchorage devices shall be labeled to allow for visual inspection and verification of type of anchorage device.

1.9 WELDING

A. Certified Welders:

1. Structural welds shall be made only by operators who have been qualified by tests, as prescribed in the "Standard Qualification Procedure" of the American Welders Society, to perform the type of work required. Operators shall be certified welders; certification must be shown to the Resident Engineer and must be current. Provide a copy of certification(s) to the Owner's Project Manager.
2. Pipe welds shall be made by operators who have been qualified by the National Certified Pipe Welding Bureau and each operator's qualification record shall be submitted to the Designer before any work is performed. Welders' certification card must be shown to the Owner's Project Manager. Provide a copy of certification(s) to the Owner's Project Manager.
3. Shop welding shall be in accordance with the "Code for Welding in Building Construction."
4. Welders shall provide their own portable generating equipment for electric welding. Use of the Commonwealth's electrical system for welding will not be permitted.

B. Welding and Cutting:

1. Where electric or gas welding or cutting work is done above or within ten (10) feet of combustible material or above a space that may be occupied by persons, use interposed shields of incombustible material to protect against fire damage or injury due to sparks and hot metal.
2. Place tanks supplying gases for gas welding or cutting at no greater distance from the work than is necessary for safety, securely fastened and maintained in an upright position in accordance with applicable codes. Store such tanks in a locked enclosure remote from any combustible material and free from exposure to the rays of the sun or high temperatures.
3. Maintain suitable fire extinguishing equipment near all welding and cutting operations. When operations cease for the noon hour or at the end of the day, thoroughly wet down the surroundings adjacent to welding and cutting operations.
4. Station a workman equipped with suitable fire extinguishing equipment near welding and cutting operations to see that sparks do not lodge in floor cracks or pass through floor or wall openings or lodge in any combustible material. Keep the workman at the source of work which offers special hazards for thirty (30) minutes after the job is completed to make sure that smoldering fires have not been started.
5. Place a qualified electrician in charge of installing and maintaining electric and arc welding equipment. Remove damaged electric, arc or gas welding equipment from the site.

1.10 MANUFACTURER'S REPRESENTATIVES

A. If required by specific Specification Sections, manufacturer's representative shall be present at the job site for supervision of work during installation of materials. Such representative shall be present during all aspects of construction to ensure proper installation of all applicable items. Refer to other sections of these specifications for additional requirements.

1.11 EXAMINATION OF SUBSTRATE

A. Installers of materials, products or equipment shall:

1. Examine base surfaces upon which materials, products or equipment are to be installed.
2. Examine conditions upon which materials, products or equipment are to be installed.
3. Where there is any question as to the dryness of a surface, test with a modern moisture-indicating machine.
4. Notify the General Contractor, in writing, with a copy to the Designer, if conditions are detrimental to proper and timely construction and completion of the work.

B. Do not proceed with work until unsatisfactory substrate, or not acceptable conditions have been corrected. Commencement of installation constitutes acceptance of substrate or base surfaces, and the cost of any corrective work due shall be borne by the installer applying his/her materials, products or equipment thereon.

1.12 GENERAL CONTRACTOR'S QUALITY ASSURANCE AND QUALITY CONTROL PLAN

A. The General Contractor's Quality Assurance and Quality Control Plan shall instill an expectation that all work will be completed correctly and in an expeditious manner. In all instances the General Contractor shall be responsible for the adherence to and enforcement of the General Contractor's Staff and all Subcontractors to this plan.

1. Submit the General Contractor's Quality Assurance and Quality Control Plan to the Owner's Project Manager within 30 days from the Notice to Proceed. Submit in format acceptable to Owner's Project Manager. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out General Contractor's quality-assurance and quality-control responsibilities. Coordinate with General Contractor's construction schedule.

B. The Plan shall include specific procedures for conducting formalized inspections of predetermined selected work items at the time the General Contractor first starts new work. These inspections are performed by a designated QA/QC Inspection Team composed of authorized representatives from the Owner, the General Contractor, A/E, Subcontractor(s) (whose work is being inspected) and others as may be required.

C. The Quality Assurance and Quality Control Plan shall be created as a General Contractor Project Specific Quality Plan addressing at a minimum the following components:

1. Quality meetings.
   a. Pre-construction conference.
   b. Pre-installation review meetings.
   c. Coordination meetings.
2. Regular Daily Inspections.
3. Building Exterior Envelope Review.
4. First Delivery of Material / Equipment Inspections.
5. First Equipment in Place Inspections.
6. Mock-up Inspections.

7. Bench Mark Inspections.
8. Follow-Up Bench Mark Inspections.
9. Below Grade / In-Wall and Above Ceiling Inspections.
10. Utility Activation and Start-Up Inspection Procedures for Equipment/Systems Prior to Validation.

D. Quality Meetings:

1. Pre-construction Conference:
   a. A conference held to discuss all aspects of the construction project such as the schedule, payment procedures, change order procedures and much more. This meeting is held immediately after contract award.
   b. The Owner's Project Manager, Designer, Design Consultants, General Contractor and Subcontractors will attend these meetings.
2. Pre-Installation Review Meetings:
   a. A review meeting shall be held for certain kinds of work requiring special coordination efforts between Subcontractors, a better understanding of how the work is to be performed by one or more Subcontractors, sequencing of work between the Subcontractors, or a review of special requirements pertaining to the work to be performed. This type of meeting is conducted just prior to starting the actual work. The meeting is scheduled and run by the General Contractor on an as needed basis.
   b. The Owner's Project Manager, Designer, General Contractor and all applicable Subcontractors will attend these meetings.
   c. The General Contractor's Staff and Subcontractor's actual supervisory people who will be performing the work in the field are to attend these meetings.
   d. Safety precautions relating to the work to be performed are also to be discussed as part of this meeting.
3. Coordination Meetings:
   a. The General Contractor shall conduct project Coordination Meetings at regular intervals. Project Coordination Meetings are in addition to specific meetings held for other purposes, such as regular progress meetings and special pre-installation meetings. An example would be regularly scheduled MEP coordination meetings to monitor the progress of the MEP coordination process.
   b. General Contractor shall request representation by every party currently involved in coordination or planning for the construction activities involved.
   c. General Contractor shall record meeting results and distribute copies to everyone in attendance and others affected by decisions or actions resulting from each meeting. The Owner's Project Manager and the Designer are to be on the Distribution List.

E. Regular Daily Inspections:

1. The General Contractor will monitor the quality of the in-place construction work daily, to ensure that it complies with the requirements of the Contract Documents, Pre-Construction Meetings, Pre-Installation Meetings and Coordination Meetings.
2. The General Contractor shall log, record and distribute daily record of quality monitoring as a component of daily reporting and provide notification on a regular basis during construction of currently observed items requiring corrective action

3. The QA/QC Inspection Team will inspect work periodically based on observations noted in General Contractor's reporting to verify completion and compliance.

F. First Delivery of Material/Equipment Inspection:

1. The General Contractor shall manage and keep current an anticipated delivery schedule for all materials and equipment to be delivered to the site and provide regular updates or upon request to the Owner's Project Manager and QA/QC Inspection Team.
2. The General Contractor shall log, record and distribute any account on the first delivery of each type of material or equipment as a component of daily reporting and provide notification on a regular basis during construction of currently observed items requiring corrective action
3. First deliveries will be verified against the requirements of the design documents and the approved submittals. Nonconforming materials and/or equipment will not be allowed to be set into place and will be removed from the site.
4. This inspection establishes the basis for judging all future deliveries of like material/equipment.

G. First Equipment In Place Inspection:

1. The General Contractor shall manage and keep current an anticipated schedule for all materials and equipment to be inspected in place and provide regular updates or upon request to the Owner's Project Manager and QA/QC Inspection Team.
2. General Contractor and QA/QC Inspection Team will inspect and document the first setting of equipment to verify it is in conformance with the requirements of the Contract Documents.
3. The installation and assembly will be verified against the requirements of the design documents and the approved shop drawings.
4. The General Contractor shall log, record and distribute any account for each type of first in place equipment inspection as a component of daily reporting and provide notification on a regular basis during construction of currently observed items requiring corrective action or pending inspection.
5. Upon acceptance of the equipment in place, the General Contractor can proceed with permanently anchoring it into place by the means prescribed in the Contract Documents.
6. This inspection establishes the basis for judging all future setting of like equipment.

H. Mock-Up Inspections:

1. The General Contractor will note all Mock-Ups required by the Contract Documents and include the activity in their construction schedule and submit for review and approval of the Owner's Project Manager, the Designer and the QA/QC Inspection Team.
2. The General Contractor shall log, record and distribute any account of Mock-Up(s) as a component of daily reporting and provide notification on a regular basis during construction of currently observed items in process, requiring corrective action, or follow up, and inspection.
3. General Contractor will benchmark each work type within the Mock-Up for conformance with the requirements and review with the QA/QC Inspection Team.
4. The QA/QC Inspection Team shall review, comment that the work appears in conformance to the requirements. Comments are documented and distributed by the

General Contractor. Non-conforming work will be corrected at no additional cost to the Owner.

5. The approved Mock-Up establishes a basis for judgment for all later like construction.
6. The Mock-Up process and inspection(s) does not take away from the responsibility of the General Contractor and installing contractors to provide a finished and fully functioning product and to maintain the construction schedule.

I. Benchmark Inspections (In Sequence Work):

1. The General Contractor in consultation with the Owner's Project Manager, Designer and QA/QC Inspection Team will establish which work will be scheduled for benchmarking during the normal course of construction.
2. The General Contractor shall log, record and distribute any account of Benchmark(s) as a component of daily reporting and provide notification on a regular basis during construction of currently observed items in process, requiring corrective action, or follow up, and that require inspection.
3. General Contractor shall note that the work to be inspected has been started and if found to be acceptable shall call for a benchmark inspection to be conducted by the QA/QC Inspection Team.
4. The QA/QC Inspection Team shall review, comment that the work appears in conformance to the requirements. Comments are documented and distributed by the General Contractor. Non-conforming work will be corrected at no additional cost to the Owner.
5. This inspection establishes the basis for judging all future work of a like type, none of which shall commence until the benchmark is approved.
6. The Benchmark process and inspection(s) does not take away from the responsibility of the General Contractor and installing contractors to provide a finished and fully functioning product and to maintain the construction schedule.

J. Follow-Up Benchmark Inspections:

1. The General Contractor shall ensure that all subsequent work being built of the same type of work that was previously benchmarked will be built in conformance to the Benchmarked work without deviation.
2. The General Contractor and QA/QC Inspection Team will randomly inspect subsequent work being built of the same type of work that was previously benchmarked to ensure the work is being built in conformance with the benchmarked work.
3. The General Contractor shall log, record and distribute any account of follow-up benchmark(s) as a component of daily reporting and provide notification on a regular basis during construction of currently observed items in process, requiring corrective action, or follow up, and that require inspection.

K. Below Grade / In Wall and Above Ceiling Inspections:

1. It is the intent of this section to mandate inspection of as much of the work that is to be enclosed before it has been covered over to avoid having to reopen closed spaces to complete or correct work therein.
2. The General Contractor shall verify that all work is complete within the concealed space and is ready to be inspected before it is enclosed.

3. The General Contractor and all Subcontractors who have work installed within the work area shall sign a closure form stating that their work has been completed and has been inspected by all applicable code officials. General Contractor will be responsible for all costs to have the space reopened later to complete or correct any work within the space, and to have the space closed again, including all costs incurred for any schedule impacts due to this work.
4. Photographs of areas to be permanently enclosed will be taken by General Contractor and retained as a part of the project record.
5. The General Contractor shall log, record and distribute account of below grade, in wall or above ceiling inspections as a component of daily reporting and provide notification on a regular basis during construction of currently observed items in process, requiring corrective action, or follow up.
6. No closure or covering of work shall proceed until all requirements are met and approval given by the QA/QC Inspection Team where such inspections are to be conducted.

L. Activation and Start-Up Inspection Procedures for Equipment/Systems Prior to Validation. Refer also to Section 01 81 00 - COMMISSIONING for additional requirements.

1. Activation Inspection:
   a. The Activation Inspection is required when the General Contractor has verified that system work meets the contract document requirements and has completed the static installation of equipment/systems, and is ready to place it into dynamic operation for the purposes of shakedown, debugging, check-out and similar activities.
   b. The General Contractor shall log, record and distribute any account of pending activations as a component of daily reporting and provide separate individual notification at a minimum of 48 hour notice prior to the scheduled time for placing specific equipment into dynamic operation.
   c. The General Contractor will notify the QA/QC Inspection Team who will inspect the work, the surroundings and provide comment that the installation is safe and appears meets the requirements for operation.
   d. Any deficiencies noted shall be corrected immediately
   e. The General Contractor will then place the equipment/systems into operation for his use, shakedown, debugging, check-out, and similar activities.
2. Start-Up Inspection:
   a. The General Contractor will coordinate with the Commissioning Agent to ensure that start-up procedures, O&M's, prefunctional checklists and testing, equipment manufacturer's representation are completed and/or in place according to the approved Commissioning Plan.
   b. The General Contractor shall log, record and distribute any account of pending startups as a component of daily reporting and provide separate individual notification at a minimum of 48 hour notice prior to the scheduled time for placing specific equipment into final operation.
   c. The General Contractor shall coordinate with the QA/QC Inspection Team and the Commissioning Agent to ensure that the installation operates as required.
   d. All non-conforming work will be corrected immediately.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 42 00

REFERENCES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract including, but not limited to, the following:

1. The Owner.
2. The Designer (the Engineer-of-Record as applicable).
3. The Owner’s Project Manager.
4. The General Contractor.

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

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

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

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

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

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

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

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

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

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

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source, and have available on site for reference.

1.4 ABBREVIATIONS AND ACRONYMS

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

AA	Aluminum Association, Inc. (The)
AAMA	American Architectural Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABAA	Air Barrier Association of America
ACI	ACI International (American Concrete Institute)
AGC	Associated General Contractors of America (The)
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ALSC	American Lumber Standard Committee, Incorporated
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
APA	APA - The Engineered Wood Association
ARMA	Asphalt Roofing Manufacturers Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International

	(The American Society of Mechanical Engineers International)
ASTM	ASTM International
	(American Society for Testing and Materials International)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
CDA	Copper Development Association
CISCA	Ceilings & Interior Systems Construction Association
CRI	Carpet & Rug Institute (The)
CSI	Construction Specifications Institute (The)
DHI	Door and Hardware Institute
EPA	Environmental Protection Agency (United States)
FM	Factory Mutual
FMRC	Factory Mutual Research
	(Now FM Global)
FSC	Forest Stewardship Council
GA	Gypsum Association
GANA	Glass Association of North America
GS	Green Seal
HPVA	Hardwood Plywood & Veneer Association
ICRI	International Concrete Repair Institute, Inc.
IESNA	Illuminating Engineering Society of North America
ILI	Indiana Limestone Institute of America, Inc.
ISO	International Organization for Standardization
ISSFA	International Solid Surface Fabricators Association
ITS	Intertek Testing Service NA
LEED	Leadership in Energy & Environmental Design (USGBC)
MFMA	Maple Flooring Manufacturers Association, Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NAIMA	North American Insulation Manufacturers Association
NBGQA	National Building Granite Quarries Association, Inc.
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NFPA	NFPA
	(National Fire Protection Association)
NFRC	National Fenestration Rating Council
NOFMA	NOFMA: The Wood Flooring Manufacturers Association
	(Formerly: National Oak Flooring Manufacturers Association)
NRCA	National Roofing Contractors Association
NSF	NSF International
	(National Sanitation Foundation International)
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
NWWDA	National Wood Window and Door Association
	(Now WDMA)
SDI	Steel Deck Institute

SDI	Steel Door Institute
SGCC	Safety Glazing Certification Council
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
TCA	Tile Council of America, Inc.
UL	Underwriters Laboratories Inc.
USGBC	U.S. Green Building Council
WCLIB	West Coast Lumber Inspection Bureau
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WWPA	Western Wood Products Association

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of current edition of Codes in the Commonwealth of Massachusetts.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 43 25

TESTING AGENCY SERVICES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 SUMMARY

A. The Owner may engage an independent testing agency at its own expense to perform certain testing, to confirm compliance with contract requirements and criteria described in the various Specification Sections and as the Owner's Project Manager deems appropriate. It is the General Contractor's responsibility to provide and pay for its own inspection and testing. See Section 01 40 00.

B. Refer also the list of testing below, and to individual Specification Sections for the types and frequency of testing to be performed by the Owner's independent testing laboratory.

1.3 RELATED SECTIONS

A. GENERAL CONDITIONS

1. Inspections and testing required by laws, ordinances, rules, regulations, or orders of public authorities.

B. Section 01 40 00 – QUALITY REQUIREMENTS

1. General Contractor's responsibility for testing services to maintain quality control.

1.4 Owner TESTING AGENCY SERVICES

A. Owner testing agency services may include, but not be limited to, the following:

1. Soils; in-place and fill.
2. Paving.
3. Loam and seed.
4. Concrete.
5. Waterproofing.
6. Masonry and mortar.

7. Firestopping.
8. Hangers and supports in Divisions 21-26.
9. Others as required to demonstrate compliance with Contract requirements.

B. Each independent inspection and testing agency engaged on the project shall be authorized by authorities having jurisdiction to operate in the Commonwealth of Massachusetts.

1.5 ENGAGEMENT OF INDEPENDENT TESTING LABORATORY

A. The Owner may engage and pay for the services of independent inspectors and an independent testing laboratory to perform the services specified under various Sections of the Specifications.

B. The services of a testing laboratory as specified in this Section is intended for the Owner's Project Manager's verification of the General Contractor's compliance with the requirements of the Contract Documents. This shall in no way relieve the General Contractor of its responsibilities to provide its own quality control, to meet all requirements of the Contract and to provide a completed project free from construction defects.

C. Services and quantities of testing as specified herein are approximate and may vary. Actual services and quantities of testing will be determined by the Owner's Project Manager and the Designer during the construction period.

D. Locations for taking sample specimens for testing shall be as directed by the Owner's Project Manager and the Designer-of-Record.

1.6 GENERAL CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel and provide access to the work and to fabricator's facilities as required for the performance of their testing.

B. Provide Casual Labor and Facilities:

1. To provide access to the work to be inspected or tested.
2. To obtain and handle specimens at the site.
3. To facilitate inspections and tests.
4. To construct a storage box, on the site, of sufficient size to store cylinders which will afford protection required by ASTM C31.

C. Shop Drawings: Provide a complete set of construction documents and shop and/or erection drawings for the items being inspected and tested.

D. Samples:

1. Provide the laboratory with preliminary representative samples of materials to be tested, in requested quantities.
2. When the source, quality, or characteristic of an approved source changes or indicates lack of compliance with contract requirements, submit additional samples of materials to testing laboratory.

E. Miscellaneous Reports, Lists: When requested by the Designer or testing laboratory, the General Contractor shall immediately provide copies of mill reports, cutting lists, shipping bills, material bills, time and place of shipment of materials to shop and field, and any relevant data on pressure testing and investigations of materials.

F. Notification:

1. To facilitate the timely sequence of inspection and testing, the General Contractor shall give advanced notification to the testing laboratory and the Designer that work has progressed to the point where inspection and testing may proceed.
2. Advanced notification shall be 48 business hours (minimum) prior to commencement of activity requiring testing and inspection.

1.7 GENERAL CONTRACTOR'S QUALITY CONTROL

A. Services of testing laboratory retained by the Owner is for verification of General Contractor's compliance and, if such tests or inspection indicates failure to comply with these Contract Documents, the General Contractor shall bear all costs associated with additional testing and inspection after the work has been corrected, to verify compliance.

B. Provide a Quality Control Program, to the Owner's Project Manager and the Designer for their approval that includes monitoring and enforcement of the quality programs of all Subcontractors. See Section 01 40 00 Quality Requirements.

1.8 PATCHING

A. Areas where samples are taken for purposes of testing shall be patched by the General Contractor to the satisfaction of the Owner's Project Manager and the Designer-of-Record.

1.9 REPORTING OF RESULTS

A. The testing laboratory shall document the values obtained in all tests, and shall indicate degree of compliance with the requirements of the Contract Documents. Test reports shall include the following information:

1. Designer's project name and number.
2. Type and location of test sample and time and date obtained.
3. Type of test, ASTM or other appropriate designation.

4. Result of test and degree of compliance with Contract Documents.

B. Testing laboratory shall, on a weekly basis, distribute results of all tests as follows:

1. Owner' Project Manager – 1 copy
2. Designer – 1 copy
3. Consulting Engineers (as designated by the Designer) – 1 copy
4. General Contractor – 1 copy
5. Subcontractor – 1 copy

C. Notify all parties immediately in the event that test results indicate that strengths, required by the Contract Documents, will not be attained.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITES AND CONTROLS

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 REQUIREMENTS INCLUDED

A. Temporary Facilities and Controls including the following:
1. Temporary Water.
2. Weather Protection.
3. Temporary Power.
4. Hoisting Equipment and Machinery.
5. Staging.
6. Maintenance of Access.
7. Dust Control.
8. Noise Control.
9. Indoor Air Quality (IAQ) Management.
10. Enclosures.
11. Cleaning During Construction.
12. Field Offices.
13. Telephone Service.
14. Sanitary Facilities.
15. Construction Barriers.
16. Parking.
17. Debris Control and Removal.
18. Safety Protection.
19. Vehicle and Equipment Protection.
20. Shoring.
21. Construction Fence.
22. Project Identification Sign.

1.3 TEMPORARY WATER

A. Water will be furnished by the General Contractor up to the point indicated on the Drawings for the permanent connection to the water supply system.

B. Water shall be distributed by means of connections to the permanent service lines that are to be installed at the expense of the General Contractor.

C. Any temporary hoses and pipe lines and connections from the permanent service lines either outside or within the building, necessary for the use of the General Contractor and his Subcontractors shall be installed, protected, and maintained at the expense of the Plumbing Subcontractor.

D. Temporary hoses and temporary pipe lines used for transporting water shall not be run unattended or unprotected across parking areas, parking area entrance, walkways, plazas, or steps. Temporary hoses and temporary pipelines shall not be permitted to be installed along, through or across corridor and occupied rooms or spaces.

E. The General Contractor shall provide an adequate supply of drinking water from approved sources of acceptable quality, satisfactorily cooled, for his employees and those of his Subcontractors.

F. Use of the water may be discontinued by the Commonwealth if, in the opinion of the Owner's Project Manager, it is wastefully used.

1.4 WEATHER PROTECTION

A. It is the intent of these Specifications to require that the General Contractor shall provide temporary enclosures and heat to permit construction work to be carried on during the months of November through March in compliance with M.G.L. Chapter 149, Section 44D(G). Under no circumstances shall the General Contractor suspend any work during the months of November through March because of their reluctance to provide and pay for temporary weather protection. These Specifications are not to be construed as requiring enclosures or heat for operations that are not economically feasible to protect in the judgment of the Designer. Included in the preceding category, without limitation, are such items as site work, excavation, steel erection, erection of certain "exterior" wall panels, roofing, and similar operations.

B. "WEATHER PROTECTION" shall mean the temporary protection of that work adversely affected by moisture, wind, and cold, by covering, enclosing and/or heating. This protection shall provide adequate working areas during the months of November through March as determined by the Designer and consistent with the approved construction schedule to permit the continuous progress of all work necessary to maintain an orderly and efficient sequence of construction operations. The General Contractor shall furnish and install all "weather protection" material and be responsible for all costs, including heating required to maintain a minimum temperature of 50 degrees F. at the working surface. This provision does not supersede any specific requirements for methods of construction, curing of materials or the applicable general conditions set forth in the Contract Articles with added regard to performance obligations of the General Contractor.

C. Within 30 calendar days after his award of contract, the General Contractor shall submit in writing to the Designer for approval, three copies of his proposed methods for "Weather Protection."

D. Installation of weather protection and heating devices shall comply with all safety regulations including provisions for adequate ventilation and fire protection devices. Heating devices which may cause damage to finish surfaces shall not be used.

E. The General Contractor shall furnish and install one accurate Fahrenheit thermometer at each work area as designated by the Designer. However, one additional accurate Fahrenheit thermometer shall be provided for every 2,000 square feet of floor space where the work areas exceed 2,000 square feet.

1.5 TEMPORARY POWER

A. The DMH Corrigan building will provide electrical energy required for temporary light and power. The Electrical Subcontractor is required under Section 26 00 01 - ELECTRICAL, to provide temporary feeders of sufficient capacity from the local utility company, or from the institution power lines, at the point designated on the drawings, to provide for the electric light and power requirements of the Project while under construction and until the permanent feeders have been installed and are in operation. it is not the intent of the above statement to relieve the General Contractor of the responsibility of payment for energy consumed during construction, but rather to afford him use of permanent feeder, etc. for electric distribution during construction. Payment for energy consumed during construction shall be the responsibility of the General Contractor until either Use and Occupancy or Final Acceptance has occurred.

B. The General Contractor shall furnish a temporary generator to provide emergency power to the existing emergency system during the time when the existing generators are demolished and the new generator is installed and operational. Refer to phasing plan on E501.

C. The General Contractor shall pay for the cost of electric energy consumed by himself and by all of his Subcontractors. Any temporary wiring of a special nature, other than that specified in Section 26 00 01 - ELECTRICAL WORK, shall be paid for by the Subcontractor requiring it, such as:

1. Special circuits required by electric welders, elevators, lifts or other special equipment requiring high-amperage and/or special voltage service, etc.
2. Exterior lighting circuits for protection against vandalism, public warning lights, lights for advertising, and similar items.

D. The General Contractor and all Subcontractors, individually, shall furnish all extension cords, sockets, motors, and accessories required for their work. They shall also pay for all temporary wiring of construction offices and buildings used by them. The General Contractor shall pay for the offices of the General Contractor and the Owner’s Project Manager specified in the Contract Form.

E. All temporary wiring installed by the Electrical Subcontractor shall be removed after it has served its purpose. Use copper wire/ conductors only.

F. All relocations of temporary service to meet construction and/or phasing requirements shall be performed at no additional cost to the Commonwealth.

1.6 HOISTING EQUIPMENT AND MACHINERY

A. All hoisting equipment and machinery required for the proper and expeditious prosecution and progress of the work shall be furnished, installed, operated and maintained in safe condition by the individual Subcontractors and is so stated in each appropriately related Section of the Specifications. All costs for hoisting operating services shall be borne by the Subcontractors unless specifically excepted in the Contract Documents.
   1. A licensed equipment manufacturer's representative shall be present at all times, to witness the erection and dismantling of all hoisting equipment and machinery, whenever such equipment is being erected or dismantled. No such work will be performed without the presence of such representative.
   2. Hoisting equipment and machinery erection and dismantling shall be performed only by trained, certified, and experienced riggers qualified to perform such work.
   3. Copies of such licenses and/or certifications, clearly indicating qualifications, shall be provided to the Owner's Project Manager prior to commencement of such erecting and dismantling work.

B. Review Drawings for hoisting requirements and openness of traffic access routes to installed destinations of specified equipment and furnishings.

1.7 STAGING

A. All staging, planking and scaffolding, exterior and interior, required for the proper execution of the work and over eight feet in height, shall be furnished, installed, and maintained by the General Contractor.

   1. Erection and dismantling of staging shall be performed only by trained, certified, and experienced staging personnel qualified to perform such work.
   2. Copies of such certifications, clearly indicating qualifications, shall be provided to the Owner's Project Manager prior to commencement of such erecting and dismantling work.

B. All staging up to eight feet in height shall be provided by the individual Subcontractors as applicable to their work.

1.8 MAINTENANCE OF ACCESS

A. The General Contractor shall provide and maintain for the duration of his contract, a means of access to, around and within the site, as indicated on the Contract Drawings, for vehicular traffic and authorized personnel. This means of access shall be construed to sustain the weight of equipment customarily engaged for use in construction projects of this type and magnitude. The General Contractor shall, without additional compensation from the Commonwealth, furnish labor and materials as may be required from time to time to maintain this means of access in an acceptable condition as determined by the Designer. Pedestrian access shall provide adequate protection against falling debris, slippage, adequate lighting, warning and directional signs, and protection against construction activities.

1.9 DUST CONTROL

A. The General Contractor shall have all Subcontractors provide adequate means for the purpose of preventing dust caused by construction operations from creating a hazard, nuisance, and from entering adjacent occupied areas throughout the period of the construction contract.

B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions set forth in the Contract Articles with added regard to performance obligations of the General Contractor.

1.10 NOISE CONTROL

A. Comply with requirements of authorities having jurisdiction. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.

B. Execute construction work by methods and by use of equipment which will reduce excess noise.

1. Equip air compressors with silencers, and power equipment with mufflers.
2. Manage vehicular traffic and scheduling to reduce noise.
3. No heavy equipment may be started or idled before 7A.M.

1.11 INDOOR AIR QUALITY (IAQ) MANAGEMENT

A. Minimize exposure of building occupants, indoor surfaces, and ventilation air distribution systems to environmental tobacco smoke. At a minimum, take the following measures:

1. Prohibit smoking in the building.
2. Locate exterior designated smoking areas at least 25 feet away from entries, outdoor air intakes, and operable windows.

B. During Construction:

1. During construction meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guidelines for Occupied Buildings under Construction, Chapter 3, November 2007.
2. Protect stored on-site and installed absorptive materials from moisture damage.
3. If the Owner’s Project Manager authorizes the use of permanent heating, cooling, and ventilating systems during construction, install filter media having a Minimum Efficiency Reporting Value (MERV) of 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction. Replace air filters immediately prior to occupancy. Replacement air filters shall have a MERV 13 according to ASHRAE 52.2.

C. Construction Indoor Air Quality Management Plan Submittal:

1. Within 21 calendar days after receipt of Notice to Proceed, the General Contractor shall submit to the Owner’s Project Manager a finalized Construction IAQ Management Plan.

2. The proposed Plan shall include, but not be limited to, the following:
   a. Protection of ventilation system components during construction.
   b. Cleaning and replacing contaminated ventilation system components after construction, including filtration media.
   c. Temporary ventilation.
   d. Protection of absorptive materials from moisture damage when stored on-site and after installation, including exterior wall rain protection.
   e. Sequence of finish installation plan.
   f. Selection of cleaning products and procedures to be used during construction and final cleaning.
   g. Schedule of emission test data recorded by General Contractor's testing laboratory.

D. Take special care to prevent accumulation of moisture on materials and within packaging during delivery, storage, and handling to prevent development of mold and mildew inside packaging and on products.

E. Immediately remove from site and properly dispose of materials showing signs of mold and mildew, including materials with moisture stains.

F. IAQ Plan Implementation:

1. IAQ Manager: The General Contractor shall designate an on-site person responsible for instructing workers and overseeing and documenting results of the Construction IAQ Management Plan for the Project.
2. Distribution: The General Contractor shall distribute copies of the Construction IAQ Management Plan to the jobsite foreman, each Subcontractor, Owner's Project Manager, and the Designer.
3. Instruction: The General Contractor shall provide on-site instruction of appropriate procedures and methods to be used by all parties at the appropriate stages of the Project.
4. Preconditioning: Allow products, which have odors and significant VOC emissions, to off-gas in a dry, well-ventilated space for sufficient period to dissipate odors and emissions prior to delivery to Project.
5. Remove containers and packaging from materials prior to conditioning to maximize off-gassing of VOCs.
6. Condition products in ventilated warehouse or other building.
7. Coordinate Construction IAQ Management Plan with final cleaning.

1.12 ENCLOSURES

A. Provide temporary, insulated, weather tight closures of openings in exterior surfaces for providing acceptable working conditions and protection for materials, allowing for heating during construction, and preventing entry of unauthorized persons. Provide doors with self-closing hardware and locks.

B. All utilities including electric ducts, conduits, telephone lines, sprinklers, and other utilities shall be protected against damage from construction activity. The General Contractor shall be responsible for all damage to the utilities from construction and shall repair all such damage at no additional cost to the Owner.

1.13 CLEANING DURING CONSTRUCTION

A. Unless otherwise specified under the various Sections of the Specifications, the General Contractor shall perform clean-up operations during construction as herein specified.

1. Refer to Section 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL for additional requirements.

B. Control accumulation of waste materials and rubbish; periodically dispose of off-site in a legal manner. The General Contractor shall bear all costs, including fees resulting from such disposal.

C. Clean interior areas prior to start of finish work and maintain areas free of dust and other contaminants during finish operations.

D. Maintain project in accordance with all local, Commonwealth of Massachusetts, and Federal Regulatory Requirements.

E. Store volatile wastes in covered metal containers, and remove from premises.

F. Prevent accumulation of wastes which create hazardous conditions.

G. Provide adequate ventilation during use of volatile or noxious substances.

H. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on site.
2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
3. Do not dispose of wastes into streams or waterways.
4. Identify potential sources of cleaning water runoff and propose abatement procedures.

I. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

J. Use only those cleaning materials and methods recommended by manufacturer of surface materials to be cleaned.

K. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and windblown debris, resulting from construction operations.

L. Provide on-site containers for collection of waste materials, debris, and rubbish.

M. Remove waste materials, debris and rubbish form the site periodically and dispose of at legal disposal dump site (DEP approved).

N. Handle material in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.

O. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not damage surrounding surfaces.

1.14 FIELD OFFICES

A. The General Contractor must provide and maintain a field office for their and their sub-contractors' use. The cost of such facilities shall be borne by the General Contractor.
   1. Locate field offices as directed by the Owner.
   2. Maintain field offices in a clean and orderly manner.
   3. Remove field offices prior to the first day of school.
   4. Field office at shall be large enough to hold weekly job meetings. This field office shall also contain a scanner/copier/printer and wireless internet.

1.15 SANITARY FACILITIES

A. The General Contractor shall provide suitable toilet facilities for its staff, including workers on the job and personnel of Subcontractors.

B. Provide chemical toilets where work is in progress and in quantity required by OSHA Code.

C. Chemical toilets and their maintenance shall meet requirements of state and local health regulations and ordinances and shall be subject to the approval the Owner's Project Manager.

D. Upon completion of new toilet facilities, the Owner's Project Manager may designate a specific toilet area to be used for the General Contractor and Subcontractors engaged in the Work. However, General Contractor shall take responsibility for maintenance and cleaning of such areas and shall leave them in first class condition equal to the accepted conditions of toilet facilities not used for construction personnel.

1.16 CONSTRUCTION BARRIERS

A. Proper construction barriers shall be provided around the contract work areas as defined by the Contract Drawings or as directed by the Owner's Project Manager.

B. Construction barriers shall consist of traffic cones, ribbons, tapes, secure fencing, trench covers, wood barriers, warning signs, directional signs, and other traffic materials to keep traffic and people from area of construction and maintain ongoing operations.

C. Barriers shall be erected at such approved locations as are necessary, sufficiently cross-braced and supported adequately from floors and ceilings as required.

1.17 PARKING

A. Only during contract working hours and to the extent available, existing parking facilities located at the construction area will be available for use by the General Contractor, Subcontractors and their employees. Such parking areas shall be designated by the Owner. The Commonwealth shall not be responsible for cars, trucks, etc. or their contents and the General Contractor and his Subcontractors and material suppliers will use the designated area with this understanding.

1.18 DEBRIS CONTROL AND REMOVAL

A. Debris shall not be permitted to accumulate or migrate and the work shall at all times be kept satisfactorily clean. Facility trash receptors shall not be used for the disposal of debris. Dumpster shall be provided by the General Contractor for removal of debris for all Subcontractors.

B. Remove debris from the work site on a daily basis and dispose of same at any (private or public) DEP approved dump that the General Contractor may choose providing that the General Contractor shall make all arrangements and obtain all approvals and permits necessary from the owner or officials in charge of such dumps. Proposed dump site shall be submitted to be approved by the Owner's Project Manager prior to start of demolition. During disposal process, copies of daily receipts from dumpsite shall be submitted on a regular basis.

1.19 SAFETY PROTECTION

A. At no time shall the work be left unattended without proper safety protection and shall not be left unprotected to the weather and accessible to the public. It is the responsibility of the General Contractor to maintain proper safety protection for the public while work is in progress or unattended.

1.20 VEHICLE AND EQUIPMENT PROTECTION

A. All construction activities shall be performed in such a manner so as not to dust, stain or damage any building elements, equipment, vehicles, etc. within general vicinity of the construction work area. Any damage to these items shall be cleaned and repaired at the expense of the General Contractor.

1. All construction vehicles and equipment on site shall be effectively disabled and secured when not in use.

1.21 SHORING

A. The Subcontractors shall provide all temporary shoring and bracing as required for the proposed work. Comply with all applicable codes and standards.

1.22 CONSTRUCTION FENCE

A. A construction fence shall be provided along the entire perimeter of the contract limit lines, and shall be kept in good repair at all times, and shall be arranged to maintain ongoing operation's access and egress.

B. Construction fences shall be six feet high and of chain link, or approved equal, erected in a substantial manner, straight, plumb and true as approved by the Designer.

C. Gates shall be built into fence at such approved locations as are necessary, well cross-braced and hung on heavy strap hinges with proper post and hook for double gates. Provide heavy hasps and padlocks for each gate. Provide a set of three keys for each lock to Owner's Project Manager to facilitate emergency access.

D. Fencing shall be removed by the General Contractor at no cost to the Commonwealth at such time before final completion as the Designer directs. Restore site to acceptable condition after removing fence.

1.23 PROJECT IDENTIFICATION

A. Request sketch of sign language and graphics from the Owner's Project Manager in sufficient time that sign can be fabricated and erected at start of construction.

B. The Contractor shall provide one 6 foot high by 8 foot wide project sign as indicated and specified following, conforming to OPM requirements. Sign shall be fabricated from 1-inch thick MDO exterior grade plywood laminated with waterproof glue. Edges of sign shall be banded with 1 inch by 1/2 inch pressure treated pine banding. Contact the Owner's Project Manager for wording for this specific project.

C. Sign shall be supported by two 4 by 4 inch post supports set in 12 inch diameter concrete footings to a depth of four feet, such that sign bottom is raised 4 feet above grade. Nails, bolts, and connecting hardware shall be galvanized. Provide alternative method of support if required by site conditions and approved by the Owner's Project Manager.

D. Sign shall be lettered by a professional sign painter, in accordance with the general layouts attached. Lettering shall be gloss vinyl, size, and color as indicated as attached. Surfaces and edges of sign shall receive two coats of exterior primer and two coats of exterior gloss enamel.

E. Submit a shop drawing indicated sign construction and lettering for approval by the Owner's Project Manager. The official project title and an electronic file of the attached sketches in Autocad drawing format can be provided to the Contractor by the Owner's Project Manager upon request.

F. Locate and install the sign at location directed by the Owner's Project Manager. At the completion of the Project, remove the sign and supports completely and restore surface to original condition.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 REQUIREMENTS INCLUDED

A. Products include material, equipment, and systems.

B. Comply with Specifications and referenced standards as minimum requirements.

C. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.

D. Do not use materials and equipment removed from existing structures, except as specifically required, or allowed, by the Contract Documents.

E. In the case of an inconsistency between Drawings and the Project Manual, or within either document which is not clarified by addendum, the product of greater quality or greater quantity of work shall be provided in accordance with the Designer’s interpretation.

1.3 WORKMANSHIP

A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.

B. Perform work by persons qualified to produce workmanship of specified quality.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.4 MANUFACTURERS' INSTRUCTIONS

A. When work is specified to comply with manufacturers' instructions, submit copies as specified in Section 01 33 00 - SUBMITTAL REQUIREMENTS, distribute copies to persons involved, and maintain one set in field office.

B. Perform work in accordance with details of instructions and specified requirements.

1.5 TRANSPORTATION AND HANDLING

A. Refer to the Contract and General Conditions and Specifications Sections for requirements pertaining to transportation and handling of materials and equipment.

B. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturers' labeled and unopened containers or packaging, dry

C. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

D. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct, and products are undamaged.

1.6 STORAGE AND PROTECTION

A. Refer to the Contract and General Conditions and Specifications Sections for requirements pertaining to storage and protection of materials and equipment.

B. Store products in accordance with manufacturers' instruction, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturers' instructions.

C. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

D. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

E. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged, and are maintained under required conditions.

F. Protect masonry and stone pavers and products from damage and staining.

G. Protect finished materials, including window frames and doors, with protection acceptable to the Owner’s Project Manager.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 74 18

DEMOLITION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for recycling and disposing of demolition waste.

B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 01 35 44 - ENVIRONMENTAL PROTECTION PROCEDURES:
   a. Environmental-protection measures during construction.
2. Section 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL
   a. Additional requirements for addressing existing materials in renovation and/or remodeling projects; not applicable to new construction.

1.3 DEFINITIONS

A. Asphalt Pavement, Brick, and Concrete (ABC) Rubble: Rubble that contains only weathered (cured) asphalt pavement, clay bricks and attached mortar normally used in construction, or concrete that may contain rebar. The rubble shall not be mixed with, or contaminated by, another waster or debris.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 75 percent by weight of total waste generated by the Work.

B. Salvage/Recycle Requirements: Salvage and recycle as much non-hazardous demolition and construction waste as possible including the following materials:

1. Asphaltic concrete paving.
2. Concrete and concrete reinforcing steel.
3. Brick and concrete masonry units.
4. Coated brick, concrete, and concrete masonry units. Coatings shall include, but not be limited to: paint, stucco applications, plaster, etc.
5. Wood studs, wood joists, plywood, oriented strand board, paneling and trim.
6. Casework and cabinetry.
7. Structural steel, miscellaneous steel and rough hardware.
8. Insulation.
9. Doors, door frames and door hardware.
10. Windows, glass, plastic and glazing.
11. Metal studs.
12. Gypsum board.
13. Acoustical tile and panels.
14. Carpet and carpet pad.
15. Demountable partitions.
16. Equipment.
17. Plumbing fixtures, piping, supports, hangers, valves, and sprinklers.
18. Mechanical equipment.
19. Electrical conduit, copper wiring, lighting fixtures, lamps, and ballasts.
20. Electrical devices, switchgear, panelboards and transformers.

C. In the event the General Contractor encounters previously unidentified material that is reasonably believed to be hazardous, asbestos containing, coated with lead-based paint, or oily debris, the General Contractor shall immediately stop work in the affected area and report the condition to the Designer and the Owner. At no time shall such material be handled or disposed of by the General Contractor. The General Contractor agrees to cooperate with the Owner and any consultants engaged by the Owner to perform services with respect to the analysis, detection, removal, containment, treatment, and disposal of such regulated materials.

1.5 SUBMITTALS

A. Waste Management Plan (WMP): Submit three copies of plan within 30 days of date established for the Notice to Proceed, in a format acceptable to the Owner's Project Manager.

B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit three copies of report. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons.
4. Quantity of waste salvaged, both estimated and actual in tons.
5. Quantity of waste recycled, both estimated and actual in tons.
6. Total quantity of waste recovered (salvaged plus recycled) in tons.
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

C. Waste Reduction Calculations: Before submitting a request for Substantial Completion, submit three copies of calculated final rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

D. Facility Permitting Information: For disposal and incinerator facilities provide a copy of the facility's current solid waste management facility permit in accordance with 310 CMR 19.000.

E. Facility Permitting Information: For off-site ABC rubble crushing and/or recycling facilities, provide a statement from the facility that references its specific exemption from the solid waste regulations (per 310 CMR 16.05 (3) (e)) or provide a copy of the facility's current solid waste management facility permit in accordance with 310 CMR 19.000.

F. Record Keeping for Recycling and Landfill and/or Incinerator Disposal: Documentation to be submitted by the Contractor shall include the following as a condition of each payment:

1. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, and/or receipts.
2. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, and/or receipts.

G. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

H. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

I. Qualification Data: The Refrigerant Recovery Technician shall be certified by EPA-approved certification program and shall provide a copy of current certification to the Designer prior to starting work.

J. Statement of Refrigerant Recovery: The Refrigerant Recovery Technician responsible for recovering refrigerant shall prepare and sign a document stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations and using

equipment that has a current EPA Registration. The document shall include the name and address of technician, date refrigerant was recovered, amount of refrigerant recovered and shipped, and date of receipt of shipment by the reclaimer.

1.6 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: The Refrigerant Recovery Technician will use recycling/recovery equipment that has a current EPA Registration.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction, including but not limited to, Massachusetts solid waste regulations contained in 310 CMR 16.00 and 310 CMR 19.000.

1.7 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, and waste reduction, handling, transportation and recycling/disposal procedures. Include separate sections in plan for recycling and disposal of demolition waste. Indicate quantities by weight throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of demolition and site-clearing waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Program: List each type of waste and whether it will be recycled or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
3. Donated Materials: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt. Include names, addresses, and telephone numbers.
4. Sold Materials: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt. Include names, addresses, and telephone numbers.

D. Handling and Transportation Procedures: Include methods that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location(s) on Project site where materials separation will be located.

E. Waste Management Coordinator: Identify General Contractor employee who will be the Waste Management Coordinator for the project. The Waste Management Coordinator will be responsible for implementing, monitoring, and reporting status of waste management work plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement Waste Management Plan as approved by the Designer. Provide containers, storage, signage, transportation, and other items as required to implement WMP for the entire duration of the Contract.

B. The General Contractor shall conduct a Waste Management Meeting at the Site. The General Contractor shall review methods and procedures related to waste management including, but not limited to, the following:

1. Distribute approved WMP to everyone concerned within three days of approved submittal return.
2. Clearly identify the Waste Management Coordinator and explain the Coordinator's responsibilities.
3. Review WMP with each subcontractor when they first begin work on-site. Review plan procedures and locations established for recycling and disposal.
4. Review and finalize procedures for material separation and verify availability of containers and bins needed to maintain production.
5. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
6. Provide recycling educational literature for all workers, Subcontractors, and suppliers engaged in on-site activities.
7. Provide appropriate recycling signage for containers and workspaces.

C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, sold, and disposed.
2. Comply with project requirements for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Sale and Donation: Sale activities are not permitted on Project site. Labor for loading donated items acceptable to local trade practices; union labor if applicable

3.3 RECYCLING DEMOLITION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Receivers and Processors: Available recycling receivers and processors include, but are not limited to, those listed in the Massachusetts Recycling Directory, available from the Massachusetts State Bookstore (617-727-2834) located in the Massachusetts State House, for recycling operations within the Commonwealth of Massachusetts.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical. For waste which cannot be separated at Project site, co-mingle only with waste which is to be separated later at a recycling facility. Contamination of recycling containers with trash or other contaminants will be addressed by the General Contractor and who will be solely responsible for payment of all fines and penalties.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off User Agency's property and transport to recycling receiver or processor.

D. On-site crushing of non-coated asphalt pavement, brick, and concrete (ABC) rubble as described in 310 CMR 16.05, is allowed, provided performed in accordance with 310 CMR 16.05. All coated ABC waste must be transported off-site to an asphalt batching plant or to an ABC crushing or recycling operation that is either conditionally exempt from 310 CMR 16.00 or has been sited and permitted in accordance with 310 CMR 16.00 and 310 CMR 19.000, respectively.

3.4 RECYCLING DEMOLITION WASTE

A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.

B. Concrete: Deposit all debris in designated container to be transported to approved aggregate recycling facility to be crushed and screened for use as satisfactory soil for fill or sub-base.

C. Masonry: Deposit all masonry debris in designated container to be transported to approved aggregate recycling facility to be. crushed and screened for use as satisfactory soil for general fill or satisfactory soil for fill or sub-base. Clean and stack undamaged whole masonry units on wood pallets for reuse.

D. Wood Materials: Sort and stack salvageable members according to size, type, and length. Separate lumber waste and deposit into appropriate container. Separate engineered wood products, panel products, and treated wood materials into designated containers.

E. Metals: Separate metals by material type if practical. Stack salvageable structural steel members according to size, type of member, and length.

F. Asphalt Shingle Roofing: Organic and glass-fiber asphalt shingles and felts shall be disposed of at a facility permitted by Massachusetts Department of Environmental Protection (DEP) to process post-consumer (used) asphalt shingles. Recycle nails, staples acceptable, flashing trim and accessories as metals.

1. Asbestos containing shingles shall be pre-abated and properly disposed of by a Massachusetts licensed asbestos abatement General Contractor, in accordance with all applicable regulations. Asbestos abatement work, including disposal of asbestos contain materials, is not included in the scope of the Work and will be performed by others.

G. Glass: Deposit glass debris into designated containers to be transported to approved glass-recycling facility.

H. Plastics: Deposit plastic containers and debris into designated containers to be transported to approved plastic recycling facility.

I. Gypsum Board: Deposit scraps of gypsum board into designated container protected from weather and transport to appropriate gypsum-recycling facility to be processed into soil amendment.

J. Acoustical Ceiling Panels and Tile: Deposit pulp able mineral fiber panels into designated container protected from weather and prepare for transport, as directed by manufacturer, to appropriate recycling facility to be processed into new acoustic ceiling panels. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.

K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips. Store clean, dry carpet and pad in a closed container or trailer provided by carpet reclamation agency or carpet recycler.

L. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

M. Plumbing Fixtures: Separate by type and size fixtures suitable for reuse. Deposit all other fixtures into designated containers by material type to be transported to approved recycling facility.

N. Piping: Separate piping materials by material composition. Deposit in designated containers. Separate supports, hangers, valves, sprinklers, and other components by material type and deposit in designated containers for transport to approved recycling facility.

O. Lighting Fixtures: Separate lamps by type and protect from breakage.

P. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

Q. Conduit: Deposit conduit and fittings into designated container.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. For solid waste disposal facilities located in the Commonwealth of Massachusetts, dispose of materials only in facilities which currently comply with applicable state regulations, including requirements of 310 CMR 16.00 {Site Assignment for Solid Waste Facilities} and 310 CMR 19.000 {Solid Waste Management}, and local bylaws.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off the Owner's property and legally dispose of them.

3.6 ITEMS TO BE SALVAGED AND TURNED OVER TO THE OWNER.

A. Refer to Drawings for items to be salvaged and turned over to the Owner.

B. The contractor shall notify the Owner of demolition activities and give at least seven (7) days' notice for when items to be salvaged are scheduled for removal.

C. The contractor shall coordinate with the Owner for temporary storage of salvaged items.

D. Items to be salvaged shall be removed and stored with care so as not to cause damage to these items.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for recycling and disposing of construction waste.

B. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 01 35 44 - ENVIRONMENTAL PROTECTION PROCEDURES:
   a. Environmental-protection measures during construction.
2. Section 01 74 18 - DEMOLITION WASTE MANAGEMENT AND DISPOSAL
   a. Additional requirements for addressing existing materials in renovation and/or remodeling projects; not applicable to new construction.

1.3 DEFINITIONS

A. Asphalt Pavement, Brick, and Concrete (ABC) Rubble: Rubble that contains only weathered (cured) asphalt pavement, clay bricks and attached mortar normally used in construction, or concrete that may contain rebar. The rubble shall not be mixed with, or contaminated by, another waste or debris.

B. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, and/or installation of new materials as part of remodeling, renovation, or repair operations. Construction waste includes packaging.

1. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations prior to renovations or remodeling.

C. Disposal: Removal off-site of construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

A. General: Develop a Waste Management Plan that states as its objective to attain at project completion a recycling rate of 75 percent or more by weight of the total waste generated by the Work.

B. Recycling Requirements:

1. Maximize recycling of non-hazardous construction waste including the following materials:
   a. Site-clearing waste.
   b. Masonry and CMU.
   c. Lumber, wood sheet materials, and wood trim.
   d. Metals.
   e. Roofing.
   f. Insulation.
   g. Glass.
   h. Plastics.
   i. Gypsum board, refer to paragraph below.
   j. Acoustical ceiling panels.
   k. Carpet and pad.
   l. Piping.
   m. Wire and cable.
   n. Electrical conduit.
   o. Packaging: 100 percent of the following uncontaminated packaging materials: Paper, cardboard, boxes, plastic sheet and film, polystyrene packaging, wood crates, plastic pails.
2. Clean Gypsum Board Waste: For new construction and renovation projects involving 20,000 square feet or greater, divert clean (virgin material) gypsum board waste from disposal to recycling and/or reuse outlets.
   a. For new construction and renovation projects involving less than 20,000 square feet, contractors are encouraged to divert clean gypsum board waste from disposal to recycling and/or reuse outlets.
   b. Clean (virgin material) gypsum board is defined as material without any existing attached material, including but not limited to adhesives, mastics, and paints.

1.5 SUBMITTALS

A. Waste Management Plan (WMP): Submit 3 copies of Plan within 30 days of date established for the Notice to Proceed, in a format acceptable to the Owner's Project Manager.

B. Waste Management Progress Reports: Concurrent with each Application for Payment, submit three copies of report. The following information shall be included:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons.
4. Quantity of waste recycled, both estimated and actual in tons.
5. Total quantity, of waste recovered (recycled) as a percentage of total waste.

C. Waste Management Calculations: Before submitting a request for Substantial Completion, submit three copies of calculated final rates for recycling and disposal as a percentage of total waste generated by the Work.

D. Facility Permitting Information: For landfill and/or incinerator facilities, provide a copy of the facility's current solid waste management facility permit in accordance with 310 CMR 19.000.

E. Record Keeping for Recycling and Landfill and/or Incinerator Disposal: Documentation to be submitted by the General Contractor shall include the following:

1. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, and/or receipts.
2. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, and/or receipts.

F. Facility Permitting Information: For ABC rubble crushing and/or recycling facilities, provide a statement from the facility that references its specific exemption from the solid waste regulations (per 310 CMR 16.05 (3) (e)) or provide a copy of the facility's current solid waste management facility permit in accordance with 310 CMR 19.000.

G. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

H. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

1.6 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction, including but not limited to, Massachusetts solid waste regulations contained in 310 CMR 16.00 and 310 CMR 19.000.

1.7 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, and waste reduction, handling, transportation, and recycling/disposal procedures. Include separate sections in plan for recycling and disposal of construction waste. Indicate quantities by weight throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Program: List each type of waste and whether it will be recycled or disposed in a landfill or incinerator. Include points of waste generation, total quantity by weight of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
3. Donated Materials: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt. Include names, addresses, and telephone numbers.
4. Sold Materials: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt. Include names, addresses, and telephone numbers.

D. Handling and Transportation Procedures: Include methods that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location(s) on Project site where separated materials will be stockpiled.

E. Waste Management Coordinator: Identify General Contractor employee who will be the Waste Management Coordinator for the project. The Waste Management Coordinator will be responsible for implementing, monitoring, and reporting status of waste management activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement Waste Management Plan as approved by the Designer. Provide containers, storage, signage, transportation, and other items as required to implement WMP for the entire duration of the Contract.

B. The General Contractor shall conduct a Waste Management Meeting at the Site. The General Contractor shall review methods and procedures related to waste management including, but not limited to, the following:

1. Distribute approved WMP to everyone concerned within three days of approved submittal return.
2. Clearly identify the Waste Management Coordinator and explain the Coordinator's responsibilities.
3. Review WMP with each subcontractor when they first begin work on-site. Review plan procedures and locations established for recycling and disposal.
4. Review and finalize procedures for material separation and verify availability of containers and bins needed to maintain production.
5. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
6. Provide recycling educational literature for all workers, Subcontractors and suppliers engaged in on-site activities.
7. Provide appropriate recycling signage for containers and workspaces.

C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walkways, and other adjacent occupied facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be recycled, reused, donated, sold, and disposed.
2. Comply with project requirements for controlling dust and dirt, environmental protection, and noise control.

3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

A. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical. For waste, which cannot be separated at Project site, co-mingle only with waste, which is to be separated later at a recycling facility. The General Contractor will address contamination of recycling containers with trash or other contaminants and who will be solely responsible for payment of all fines and penalties.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials

at each container and bin. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off User Agency's property and transport to recycling receiver or processor.

B. On-site crushing of asphalt pavement, brick, and concrete (ABC) rubble as described in 310 CMR 16.05, is not allowed. All ABC waste must be transported off-site to an asphalt batching plant or to an ABC crushing or recycling operation facility that is either conditionally exempt from 310 CMR 16.00 or has been sited and permitted in accordance with 310 CMR 16.00 and 310 CMR 19.000, respectively.

3.3 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: To the extent feasible, require shippers using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees on-site.

C. Concrete: Deposit all debris in designated containers to be transported to approved aggregate recycling facility to be crushed and screened for use as satisfactory soil for fill or sub-base.

D. Masonry: Deposit all masonry debris in designated containers to be transported to approved aggregate recycling facility to be crushed and screened for use as satisfactory soil for general fill or satisfactory soil for fill or sub-base. Clean and stack undamaged whole masonry units on wood pallets.

E. Wood Materials:

1. Clean Cut-Offs of Lumber: Deposit into designated clean wood container to be transported to designated recycling facility for use as mulch or bio-fuel.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

F. Metals: Separate metals by material type if practical. Stack salvageable structural steel members according to size, type of member, and length.

G. Asphalt Shingle Roofing: Deposit asphalt shingles in designated containers for off-site reuse. Nails, staples acceptable, flashing trim and accessories shall be recycled as metals.

H. Glass: Deposit glass debris into designated containers to be transported to approved glass-recycling facility.

I. Plastics: Deposit plastic containers and debris into designated containers to be transported to approved plastic recycling facility.

J. Clean Gypsum Board: Deposit scraps of clean gypsum board into designated container protected from weather and transport to an appropriate gypsum board recycling outlet or permitted construction and demolition debris processing facility that will divert clean gypsum board to an appropriate gypsum board recycling outlet.

K. Acoustic Ceiling Panels: Deposit pulp able mineral fiber panels into designated container protected from weather and prepare for transport, as directed by manufacturer, to appropriate recycling facility to be processed into new acoustic ceiling panels. Separate suspension system, trim, and other metals from panels and sort with other metals.

L. Carpet: Deposit carpet into designated container protected from weather and prepare for transport, as directed by manufacturer, to appropriate recycling facility to be processed into new products.

M. General: Recycle paper and beverage containers used by on-site workers.

3.4 DISPOSAL OF WASTE

A. Except for items or materials to be recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. For solid waste disposal facilities located in the Commonwealth of Massachusetts, dispose of materials only in facilities which currently comply with applicable state regulations, including requirements of 310 CMR 16.00 {Site Assignment for Solid Waste Facilities} and 310 CMR 19.000 {Solid Waste Management}, and local bylaws.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 01 77 00

CONTRACT CLOSEOUT

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 FINAL CLEANING

A. Unless otherwise specified under the various Sections of the Specifications, the General Contractor shall perform final cleaning operations as herein specified prior to final inspection.

B. Maintain project site free from accumulations of waste, debris, and rubbish, caused by operations. At completion of work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

C. Cleaning shall include all surfaces, interior and exterior in which the General Contractor has had access whether existing or new.

D. Refer to Sections of the Specifications for cleaning of specific products or work.

E. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

F. Use only those cleaning materials and methods that are recommended by the manufacturer of surface material to be cleaned.

G. Employ experienced workmen, or professional cleaners, for final cleaning operations.

H. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.

I. All new and existing glass and plastic surfaces throughout the building shall be thoroughly cleaned and washed by qualified window cleaners at the expense of the General Contractor just prior to acceptance of the Work.

J. Repair, patch and touch up marred surfaces to specified finish, to match adjacent surfaces as acceptable to the Owner’s Project Manager.

K. Polish glossy surfaces to a clear shine and provide wax where necessary.

L. Ventilating Systems: Clean permanent filters and replace disposable filters if units were operated during construction. Units should not be operated without filters at all. Throw away

filters should be used when operating units prior to Substantial Completion. Submit report of ventilation system cleanliness including ductwork to the Owner's Project Manager.

M. Broom clean exterior paved surfaces and rake clean other surfaces of the grounds.

N. Leave all architectural metals, hardware, and fixtures in undamaged polished conditions.

O. Leave pipe and duct spaces, plenums, furred spaces and the like clean of debris and decayable materials.

P. At the end of the project, General Contractor and each Subcontractor shall remove all his tools, equipment, machinery, and surplus materials from the job site. The General Contractor shall remove all waste materials and rubbish from the project at this time. All temporary structures shall be removed and the project shall be left clean.

Q. Subsequent to installation of User Agency furniture, telephones, and equipment, and prior to issue of Certificate of Use and Occupancy, provide additional cleaning to remove any soil resulting from installations of such furniture and equipment. Such additional cleaning may include, but not be limited to dusting of horizontal surfaces, vacuuming, and washing of hard or resilient floor surfaces and re-waxing where required.

1.3 AS-BUILT DRAWINGS

A. As-built Drawings shall consist of all the Contract Drawings. As-built Drawings shall be kept up-to-date. Information from on-going Work shall be recorded on As-built Drawings within 48 hours of Work being performed.

B. The General Contractor and each Subcontractor shall be required to maintain one set of As-built Drawings, as the work relates to their Sections of the Specifications, at the site.

C. The As-built Drawings shall be stored and maintained in the General Contractor's field office apart from other documents used for construction. The As-built Drawings shall be maintained in a clean, dry, and legible condition and shall not be used for construction purposes.

D. As-built Drawings, as submitted by the General Contractor shall be verified in the field by the Designer or his Consultants. Verification by the Designer shall occur during the construction process and prior to the related work being completed and covered up.

E. The As-built Drawings shall be available at all time for inspection by the Owner's Project Manager or Designer. All deficiencies noted shall be promptly corrected.

F. The following information shall be indicated on the As-Built Drawings:

1. Record all changes, including change orders, in the location, size, number and type both horizontally and vertically of all elements of the project which deviate from those indicated on all the Contract Drawings.
2. The tolerance for the actual location of utilities and appurtenances within the building to be marked on the As-built Drawings shall be plus or minus two (2) inches.
3. The location of all underground utilities and appurtenances referenced to permanent surface improvements, both horizontally and vertically at ten (10) ft. intervals and at all changes of direction.
4. The location of all internal utilities and appurtenances, concealed by finish materials, including but not limited to valves, coils, dampers, vents, cleanouts, strainers, pipes, junction boxes, turning vanes, variable and constant volume boxes, ducts, traps and maintenance devices. The location of these internal utilities, appurtenances, and devices shall be shown by offsets to the column grid lines on the Drawings.
5. Each of the utilities and appurtenances shall be referenced by showing a tag number, area served and function on the As-built Drawings.

G. At the end of each month and before payment for materials installed, the General Contractor, each Subcontractor, and agents of the Commonwealth shall review As-built Drawings for purpose of payment.

1. If the changes in location of all installed elements are not shown on the As-Built Drawings and verified in the field, then the material shall not be considered as installed and payment will be withheld.

H. Prior to the installation of all finish materials, a review of the As-built Drawings shall be made to confirm that all changes have been recorded. All costs to investigate such conditions shall be borne by the applicable party as determined by the Designer.

I. At the completion of the contract, each Subcontractor shall submit to the General Contractor a complete set of his respective As-built Drawings indicating all changes. After checking the above drawings, the General Contractor shall certify in writing on the title sheet of the drawings that they are complete and correct and shall submit the As-built Drawings to the Designer.

1. As-Built Drawings shall be submitted electronically to the Designer, in a format which can be added to the complete plans as constructed.

J. The Designer shall review the drawings and shall verify by letter to the Owner’s Project Manager that the work is accurate. The Designer shall incorporate all changes on the original drawings; thus creating Record Drawings. The Designer shall submit to the Owner’s Project Manager, electronic files in Autocad 2000 (or later version) format with two (2) sets of prints to be used for the final inspection of the project. Inaccuracies in As-built Drawings, as determined by the Designer and the Owner’s Project Manager, may be grounds for postponement of the final inspection or delay the processing of final payment until such inaccuracies are corrected by the General Contractor.

1.4 OPERATING AND MAINTENANCE REQUIREMENTS

A. At least two weeks prior to the time of turning over this contract to the Operating Agency for Use and Occupancy, or Final Acceptance, the General Contractor shall secure and deliver to the Operating Agency via the Designer, three (3) complete, indexed files and three (3) CD or DVD copies, containing approved operating and maintenance manuals, shop drawings, record of paint colors, floor and ceiling materials and other data as follows.

1. Operating manuals and operating instructions for each model and type of equipment in each of the various systems. Include operating instructions for systems integrating several pieces of equipment.
2. Catalog data sheets for each item of mechanical or electrical or equipment actually installed including performance curves, rating data and parts lists.
3. Catalog sheets, maintenance manuals, and approved shop drawings of all mechanical or electrical equipment controls and fixtures with all details clearly indicated, including size of lamps and other maintenance supplies.
4. Names, addresses and telephone numbers of all Subcontractors and suppliers, together with repair and service companies for each of the major systems installed under this contract.
5. Provide a steel cabinet for storage of manuals and operating instructions.

B. Non-Availability of operating and maintenance manuals or inaccuracies therein may be grounds for cancellation and postponement of any scheduled final inspection by the Owner's Project Manager until such time as the discrepancy has been corrected.

1.5 CLOSEOUT REQUIREMENTS AND SUBMITTALS

A. Procedural Requirements Prior to Use and Occupancy: Punch List:

1. During the finishing stages of the project, the General Contractor shall make frequent inspections with Subcontractors, the Designer, and the Owner's Project Manager, so as to progressively check for and correct faulty work.
2. During the course of construction of the project, the General Contractor shall procure and maintain test records and certificates that will be required prior to issuance of the Department of Public Safety (DPS) Certificate of Occupancy and the Certificate of Agency Use and Occupancy.
3. When the General Contractor determines that he/she is Substantially Complete*, he/she shall prepare for submission to the Designer a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the General Contractor to complete all work in accordance with contract Documents. The General Contractor's list shall be accompanied with certificates that will be required as prerequisites for applying for a DPS inspection
   a. *NOTE: Substantially Complete means that less than one percent (1%) of all contract work, including change orders, remains to be done, and that none of the remaining work will affect health, safety, or function.
4. Upon receipt of the General Contractor's list of items to be completed or corrected, the Designer will promptly make a thorough inspection, together with representatives of the Owner and the Operating Agency, and prepare a "punch list", setting forth in accurate

detail any items on the General Contractor's list and additional items that are not acceptable. Concurrently, the General Contractor will arrange for a DPS inspection.

5. When the punch list has been prepared, and any DPS Inspector comments* have been included, the Designer will arrange a meeting with the General Contractor and Subcontractors, and the Owner's Project Manager, to identify and explain all punch list items and answer questions on the Work that must be done before Final Acceptance.
    a. If a DPS inspector (including, but not limited to AABA, boiler, elevator or any other authorized inspector) requires modifications and/or additions that were not included in the construction documents, the Designer should review the applicable code(s) and provide written interpretation to the Owner's Project Manager together with his/her recommendations.
6. The General Contractor shall immediately correct all punch list items that affect health, safety or function (as determined by the Designer, completion of which is required before issuance of a Certificate of Agency Use and Occupancy).
7. Upon receipt of the Certificate of Agency Use and Occupancy, and its adjunct monetized punch list, the General Contractor shall cause the completion of all of the other punch list items within the timeframe required by said certificate, but not more than 45 calendar days if the timeframe is not indicated on the said certificate.
8. There is a history of specific items that are essential to the Use and Occupancy, but are frequently overlooked. Some things to watch for are:
    a. Provide properly colored and positioned exit signs.
    b. Properly located emergency lighting fixtures.
    c. Complete or, by agreement, schedule personnel training.
    d. Final cleaning.
    e. Ventilating systems:
        1) Clean permanent filters and replace disposable filters if units were operated during construction.
        2) Clean ducts, blowers, and coils if units were operated without filters during construction.
        3) Leave pipe and duct spaces, plenums, furred spaces and the like clean of debris and materials subject to decay.
    f. Provide a properly working lock for the medical environmental closets (if applicable).
    g. Assure that exterior and interior fire rated and egress doors are operating properly and have the proper hardware.
    h. Assure that fire-rating labels are on doors and frames that are supposed to have them.
    i. Assure that smoke barriers are properly installed and located.
    j. Assure that the spare set of each type of sprinkler head and a head removal tool have been provided.
    k. Assure that floors drain properly.
    l. Assure that proper hot water temperatures are provided. Unless otherwise specified or required by a User Agency, the temperature set on building master controllers of hot water shall apply:
        1) HW to individual tubs or showers shall be controlled, in addition to the master controller above, with thermostatic valves set to furnish HW at a temperature not exceeding 110°F and equipped with anti-scald feature.
    m. Assure that proper water pressure is provided for the sprinkler system.
    n. Assure that low-consumption (LC) toilets have been installed (1.6 gpf or less).

o. Re-lamp if permanent lighting system was used during construction.
p. As-built marked-up drawings should be completed and transferred over to the Designer.

B. Prerequisites for Department of Public Safety (DPS) Certificate of Inspection and/or Certificate of Occupancy: Prior to requesting a Department of Public Safety (DPS) inspection, the General Contractor shall provide the following "closeout submittals:"

1. Project record documents and as-built marked-up drawings.
2. Approved operating and maintenance (O & M) data.
3. Extended guarantees and warranties.
   a. General Contractor's General Guarantee shall effectively include:
      1) A written guarantee, for one (1) year from date of Substantial Completion of the project, against defective workmanship, material, installation and equipment for all work of the project. Repair or replacement of defective workmanship, material, installation or equipment that develop within this period shall be accomplished promptly upon notification to the General Contractor, to the satisfaction of the Operating Agency, at no cost.
      2) Replace or repair material or equipment that requires excessive service during the guarantee period.
      3) Guarantee shall include 24-hour service of complete system(s) during guarantee period at no additional cost.
      4) Provide manufacturer's engineering and technical staff at site promptly to analyze and rectify problems that develop during guarantee period. If problems cannot be rectified promptly, to the satisfaction of the User Agency, advise the Designer in writing; describe efforts to rectify situation and provide analysis of cause of problem.
   b. Manufacturer's Guarantee or Warranty
      1) In addition to guarantee requirements above, obtain manufacturers' written installation, equipment, and material warranties for time periods indicated in the various Specification Sections of the Contract Documents. Such manufacturers' warranties contained within the Specification Sections, together with any other warranties offered in manufacturers' published data, are to be transferred to the User Agency.
   c. Keys and keying schedule.
   d. Spare parts and maintenance materials ("attic stock"),
   e. Evidence of compliance with requirements of governing authorities including, without limitations, the following:
      1) Certificate of Inspection, in form of signed permits from the electrical, plumbing, gas, fire department, boiler, and any other required inspectors.
      2) Certification from the local fire department to the effect that all detection, alarm and suppression systems, and other equipment or systems under fire department jurisdiction are approved.
      3) When carpeting and/or draperies are provided, a flame, smoke and fuel-rating certificate provided by the supplying General Contractors.
      4) Elevator certification(s) from the elevator inspector obtained through the General Contractor's Elevator Subcontractor.
      5) A letter from the Plumbing Subcontractor. that the potable water supply has been sanitized.

6) Septic system certification obtained from the town by the General Contractor (when applicable).
7) Pressurized vessel certifications from the boiler inspector obtained through the Mechanical Subcontractor.
8) When air balancing is required, the air balancing report prepared by the Mechanical Subcontractor (or commissioning agent, when applicable), and accepted by the design Registered Professional Engineer.
9) When smoke control/fire emergency ventilation system is required, the test report prepared by the Mechanical Subcontractor (or commissioning agent, when applicable), and accepted by the design Registered Professional Engineer.
10) Evidence of test and approval for Department of Environmental Protection (DEP) and Department of Public Health (DPH), when applicable.

C. Prerequisites for Department of Public Safety (DPS) Certificate of Inspection and/or Certificate of Occupancy: Prior to requesting a Department of Public Safety (DPS) inspection, the Designer shall provide the following "closeout submittals:"

1. Certification, from the design Registered Professional Engineer, stating that the fire protection systems have been installed in accordance with the approved fire protection construction documents and meet the requirements of 780 CMR 903.1.
2. Structural Engineer-of-Record (SER) final report as required by 780 CMR 1705.3.
3. Certification, from the design Registered Professional Engineer, stating that the emergency lighting and power systems have been installed in accordance with the approved electrical construction documents.

D. Upon completion of the Work for which a permit has been issued, the DPS building official shall conduct a final inspection pursuant to 780 CMR 115.5.

E. Beneficial and Temporary Occupancy:

1. Beneficial (partial) Occupancy:
   a. The Owner may allow beneficial (partial) occupancy of portions of a building in order to allow a User Agency to set up and test their own operational equipment in select building areas. It does not allow for use and/or occupancy of the general public when, in fact, the building cannot function for the use(s) it is intended to accommodate, nor when there are outstanding items that effect health, safety and/or function.
   b. It is the Owner's policy to disallow beneficial occupancy if the fire alarm and suppression systems are inoperative.
   c. Beneficial occupancy of building areas shall not constitute Substantial Completion, or Final Acceptance of work by the Owner, and shall not institute the guarantee period for any work.
   d. A punch list will be developed for building areas to receive beneficial occupancy and the building areas will be photographed prior to such occupancy of said portion or portions of the work.

2. Temporary Occupancy:
   a. When, according to 780 CMR 120.3 – Temporary Occupancy upon the request of the holder of a permit, a Temporary Certificate of Occupancy (TCO) may be issued before the completion of the entire work covered by the permit, provided that such portion or portions shall be occupied safely prior to full completion of the building or structure without endangering life or public welfare. The Building Official may consult with all Subcontractor Inspectors for issues pertaining to life safety and shall consult with the Fire Official pertaining to issues of adequacy of fire protection systems prior to the issuance of a Temporary Certificate.
   b. The Building Official may issue a Temporary Certificate of Occupancy (TCO) that can allow public use and occupancy of said portion or portions of the work, subject to punch list(s) being established prior to such occupancy.
   c. Issuance of a Department of Public Safety (DPS) Temporary Certificate of Occupancy (TCO) does not relieve the General Contractor of the Owner requirements of the contract and does not constitute Substantial Completion of the project.
   d. Temporary Occupancy of building areas will institute the guarantee period for completed work of all Divisions except 21 through 28 of the Specifications for those building areas so used and occupied, exclusive of remaining work indicated on associated punch lists. Use of systems provided under Divisions 21 through 28 of the Contract Documents for temporary services and facilities shall not constitute Substantial Completion, or Final Acceptance of work by the Owner, and shall not institute the guarantee period.
      (1) If it is determined that there are no items on the punch list that affect health, safety or function and it is agreed by the Building Official, the Designer and the Owner's Project Manager that the entire building can be granted a Temporary Certificate of Occupancy (TCO), the work of all Divisions including 21 through 28 of the Specifications for the entire building so used and occupied, exclusive of remaining work indicated on associated punch lists, will institute the guarantee period for completed work of all Divisions including the systems provided under Divisions 21 through 28.
      (2) Whereas a User Agency cannot properly maintain building systems without operating and maintenance documentation, subcontractors for Divisions 21 through 28 will be responsible for maintaining their respective building systems at no additional cost to the contract until the project is substantially complete and Operating and Maintenance (O & M) manuals, reviewed and approved by the Designer, are provided to the Owner's Project Manager.
      (3) Issuance of a Temporary Certificate of Occupancy (TCO) may require remaining punch list work to be completed during irregular work hours. Such work will be performed at no additional cost to the contract.
   e. The following Owner's criteria, and any other criteria that may be imposed by the Building Official, are required for a DPS Temporary Certificate of Occupancy (TCO):
      (1) Upon receipt of the General Contractor's list of items to be completed or corrected, the Designer will promptly make a thorough inspection, together with representatives of the Owner, and prepare a "punch list", setting forth in accurate detail any items on the General Contractor's list and additional items that are not acceptable. The Designer and Owner's Project Manager will identify and tag (by asterisk) all items that, in their opinion, affect

health, safety or function. The Building Official may include additional items that, in her/his opinion, affect items that endanger life or public welfare.

(2) When the punch list has been prepared, and all DPS Inspector comments* have been included, the General Contractor shall immediately correct all punch list items that affect health, safety or function (all asterisked items). This work must be completed before the issuance of a DPS Temporary Certificate of Occupancy (TCO).

* NOTE: If a DPS inspector (including, but not limited to AABA, boiler, elevator or any other authorized inspector) requires modifications and/or additions that were not included in the construction documents, the Designer should review the applicable code(s) and provide written interpretation to the Owner's Project Manager together with their recommendations.

f. Exclusive of other items that the DPS inspector may impose, there is a history of specific items that are essential for, temporary occupancy. These items include, but are not limited to the following:

(1) Properly colored and positioned exit signs.
(2) Properly located emergency lighting fixtures.
(3) Clean ducts, blowers, and coils if units were operated without filters during construction.
(4) Install permanent filters and replace disposable filters if units were operated during construction.
(5) Properly working lock for the medical environmental closets (if applicable).
(6) Assure that exterior and interior fire rated and egress doors are operating properly and have the proper hardware.
(7) Assure that smoke barriers are properly installed and located.
(8) Assure that proper water pressure is provided for the sprinkler system.
(9) Assure that proper hot water temperatures are provided. Unless otherwise specified or required by a User Agency, the temperature set on building master controllers of hot water shall apply:
   (a) HW to toilet rooms and janitors closets shall be 140˚ F.
   (b) HW to individual tubs or showers shall be controlled, in addition to the master controller above, with thermostatic valves set to furnish HW at a temperature not exceeding 110˚ F and equipped with anti-scald feature.
   (c) HW rinse water to dishwashers shall be controlled at 180˚ F.
(10) Emergency eyewash equipment must be hard-plumbed and employ tempered water.

g. Evidence of compliance with requirements of governing authorities including, without limitations, the following:

1) Certificate of Inspection, in form of signed permits from the electrical, plumbing, gas, fire department, boiler, and any other required inspectors.
2) Certification from the local fire department to the effect that all detection, alarm and suppression systems, and other equipment or systems under fire department jurisdiction are approved.
3) When carpeting and/or draperies are provided, a flame, smoke and fuel-rating certificate provided by the supplying General Contractor.
4) Elevator certification(s) from the elevator inspector obtained through the General Contractor's elevator subcontractor.

5) A letter from the Plumbing Subcontractor that the potable water supply has been sanitized.
6) Septic system certification obtained from the town by the General Contractor (when applicable).
7) Pressurized vessel certifications from the boiler inspector obtained through the Mechanical Subcontractor.
8) When air balancing is required, the air balancing report prepared by the Mechanical Subcontractor (or commissioning agent, when applicable).
9) When smoke control/fire emergency ventilation system is required, the test report prepared by the Mechanical Subcontractor (or commissioning agent, when applicable).
10) Evidence of test and approval for Department of Environmental Protection (DEP) and Department of Public Health (DPH), when applicable.

F. Prerequisites for Owner's Certificate of Agency Use and Occupancy: Certificate of Agency Use and Occupancy. Prior to requesting a Certificate of Agency Use and Occupancy, the Owner's Project Manager will procure and have ready and available the following approved items (referred to as Closeout Submittals):

1. Operating and maintenance (O & M) manuals and written operating instructions for the various systems.
2. Catalog data sheets for each item of mechanical or electrical equipment actually installed including performance curves, rating data and parts lists.
3. Catalog sheets, maintenance manuals, and approved shop drawings of all mechanical and electrical equipment controls and fixtures with all details clearly indicated, including size of lamps.
4. Balancing report.
5. Names, addresses, and telephone numbers of repair and service companies for each of the major systems installed under the construction contract.
6. Signed Department of Public Safety (DPS) Certificate of Occupancy per 780 CMR 120.0
7. Licensed Builder Final Affidavit/Report.
8. Designer Affidavit of Compliance.
9. Subcontractor Affidavits that specified equipment and installed items have been seismically braced in accordance with code requirements.
10. Monetized punch list of the remaining Work that must be done before Final Acceptance.
11. As-built documents should be completed (both electronic files and transparencies) and ready to transfer over to the Owner's Project Manager. As-built documents shall consist of, but not be limited to, the following:
    a. Drawings (in AutoCAD ver. 2000 or later format)
        1) Contract drawings, for all disciplines, marked-up to clearly indicate as-built conditions.
        2) All clarification and/or changed conditions sketches (SK's).
    b. Specifications (in .pdf format)
        1) All construction specifications.
        2) All addenda.
    c. Shop drawings, submittals, etc. (scanned format)*
        1) All approved shop drawings, submittals, etc.
12. Approved documents submitted to the Owner or the Designer shall be electronically scanned (including the associated transmittals and, where applicable, the Designer-of-

Record's and Owner's comments) as a .pdf document. All scanned approved submittals shall be included on a CD.

13. The electronic file names, for each approved submittal, shall contain the following information:
    a. For APPROVED or APPROVED AS NOTED Shop Drawings:
        1) Project Number Submittal's Date, APPROVED, Submittal Name, Submittal's Specification Section Name and Number, and Submittal's Revision Number.
        2) As an example, the file name of an approved submittal for Concrete
            a) Design Mix: DFS991DC1 030106 APPROVED Concrete Design Mix Cast In Place Concrete 033000 Rev0.PDF
    b. For Shop Drawings submitted for information only, e.g., welders certificate, the electronic file name shall contain the following information:
        1) Project Number Submittal's Date, FOR INFO, Submittal Name, Submittal's Specification Section Name and Number, and Submittal's Revision Number.
        2) As an example the file name of a for information only submittal for a welder's certificate:
            a) DFS991DC1 030106 FOR INFO Welders Certificate Quality Requirements 014000 Rev0.PDF
    c. Unless otherwise stated all submitted documents shall include an electronic scanned image as noted above.
    d. The electronic file name shall be printed on every shop-drawing page.
14. The Owner's Project Manager will attach the monetized punch list to the Certificate of Agency Use and Occupancy, indicate the official date of Use and Occupancy, establish the date upon which all remaining punch list items must be completed (normally 30-45 calendar days), and procure appropriate signatures on the original and seven (7) copies.
15. After receipt of signatures, the Owner's Project Manager will distribute the signed copies.
16. Project schedules (in Primavera format, unless otherwise authorized), baseline, and all updates.
17. Notification to Operating Agency and/Or User Agency of Proposed Use and Occupancy Date: The Owner's Project Manager is to notify the Operating Agency and/or User Agency of the project Use and Occupancy date at least seven (7) calendar days in advance.

G. Prerequisites for Certificate of Final Inspection, Release, and Acceptance: Final Certificate of Final Inspection, Release, and Acceptance. Upon receipt of the Certificate of Agency Use and Occupancy, and its adjunct monetized punch list, the General Contractor shall cause the completion of all of the other punch list items within timeframe required by said certificate, but not more than 45 calendars days if the timeframe is not indicated on the said certificate.

1. If the General Contractor fails to pursue completion of the remaining monetized punch list work, on a continual basis, within the timeframe required by the certificate, the Owner may, after seven (7) calendar days written notice, elect to complete the work with separate forces and charge the work against the General Contractor.
2. At the end of the General Contractor's one (1) year guarantee period, the General Contractor shall transfer manufacturers' equipment and material warranties that are still in force to the Operating Agency.

1.6 GUARANTEES AND WARRANTIES

A. Submit to the Designer all extended guarantees and warranties that have been specified in various, individual Sections of the Specifications. Guarantees shall be assembled by Specification No. and Section in accordance with Specifications Table of Contents.

1. Guarantees and warranties shall be enforceable in the Commonwealth of Massachusetts and subject to interpretation in accordance with the laws of the Commonwealth of Massachusetts.
2. Guarantees and warranties shall begin at the date of Substantial Completion of the Project. Guarantees and warranties which start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable.

B. Unless more stringent requirements are otherwise specified, guarantee all work against defects of materials, equipment and workmanship for one year from the date of Substantial Completion or the date of issue of Certificate of Use and Occupancy for the building or portion thereof, whichever occurs first.

C. If, within any guarantee period, repairs or changes are required in connection with guaranteed work, General Contractor shall promptly upon receipt of notice from the Owner, and without additional expense to the Owner, within ten business days:

1. Place in satisfactory condition in every particular all guaranteed work and correct all defects.
2. Make good all damage to building, site equipment, or contents thereof, including redecoration which, in the opinion of the Designer, results from the use of material, equipment or workmanship which are inferior, defective or not in accord with the terms of the Contract.

D. If General Contractor, after such notice, fails to proceed immediately to comply with terms of guarantee, the Owner may correct defects and hold General Contractor liable for all expenses incurred.

E. Promptly after completion of the work, obtain from each Subcontractor where a guarantee is required, a warranty addressed to and in favor of the Owner.

F. Delivery of any warranty required does not relieve the General Contractor from any obligation assumed under other provisions of the Contract.

G. Deliver guarantees and warrantees to the Designer before or with the application for Final Payment.

H. The general warranty set forth in the General Conditions is in addition to, exclusive of, and not in substitution of such guarantees as may be required in the Specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 023000

SUBSURFACE INVESTIGATION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 SUBSURFACE INVESTIGATION

A. Information Not Guaranteed: Information on the Drawings and in the Project Manual relating to subsurface conditions, natural phenomena, and existing utilities and structures is from the best sources presently available. Such information is furnished only for the information and convenience of the Contractor, and the accuracy or completeness of this information is not guaranteed.

B. Foundation Engineering Report: Refer to the Geotechnical Report in the Appendices.

1.3 CONFIRMATION OF GRADES AND UTILITIES

A. Prior to commencement of site excavating operations, the Contractor shall compare existing site grading and proposed new site grading. Where existing utilities are indicated but their inverts or depths are not, exploratory excavating shall be performed to assure that sufficient earth coverage will be attained during the course of new site grading.

B. Utilities existing on the site shall be carefully protected from damage and relocated or removed as required by the work and in accordance with the Contract Documents. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings and the Designer, the Owner’s Project Manager, and the utility owner notified in writing.

C. If exploratory excavating confirms that the depth of existing utilities will be negatively impacted by proposed new grades (i.e., will be too shallow or become exposed), immediately notify the Designer and Owner’s Project Manager. Do not proceed with work in such areas until instructions are issued by the Designer. Continue work in other areas.

1.4 CONFIRMATION OF INTEGRITY OF ADJACENT STRUCTURES

A. Prior to commencement of site excavating operations, the Contractor shall compare foundation depths of existing structures and proposed depths of new utilities. Where existing structures are

indicated but their foundation depths are not, exploratory excavating shall be performed to assure that proposed new excavations adjacent to them, or in near proximity of them, will not undermine the structural integrity of the existing structures.

B. If exploratory excavating confirms that the footing depths of existing structures may be negatively impacted or undermined by proposed new excavations, immediately notify the Designer and Owner's Project Manager. Do not proceed with work in such areas until instructions are issued by the Designer. Continue work in other areas.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 024100

DEMOLITION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS, which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included:

1. Demolition and removal of selected portions of buildings and structures and as required for new work. Refer to the Drawings for additional requirements.
2. Demolition and removal of selected site elements and as required for new work. Refer to the Drawings for additional requirements.
3. Salvage of existing items to be reused or turned over to the facility.
4. Removal and legal disposal of demolished materials off site. Except those items specifically designated to be relocated, reused, or turned over to the facility, all existing removed materials, items, trash and debris shall become property of the Contractor and shall be completely removed from the site and legally disposed of at her/his expense. Salvage value belongs to the Contractor. On-site sale of materials is not permitted.
5. Maintenance, watering and care of trees designated to remain by a certified arborist during the construction period.
6. Demolition and removal work shall properly prepare for alteration work and new construction to be provided under the Contract.
7. Scheduling and sequencing operations without interrupting utilities serving occupied areas. If interruption is required, obtain written permission from the utility company and the Owner's Project Manager. Schedule interruption when the least amount of inconvenience will result.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 015000 - TEMPORARY FACILITIES AND CONTROLS:
   a. Maintenance of access, cleaning during construction, dust and noise control.
2. Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL:
   a. Waste management and recycling.
3. Section 260001 - ELECTRICAL:
   a. Disconnecting, capping and otherwise making inactive existing electrical services in areas where demolition and removal work is required.
   b. Disconnect and reinstallation of electrical equipment temporarily interrupted during construction.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to the User Agency ready for reuse, at a location designated by the User Agency. Protect from weather until accepted by User Agency.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated. Protect from weather until reinstallation.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques, antiques, and other items of interest or value to DCAMM that may be encountered during selective demolition remain property of the Commonwealth or user Agency as applicable. Carefully remove each item or object in a manner to prevent damage and deliver promptly to a location acceptable to the DCAMM Project Manger.

1.5 SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with early and late starting and finishing dates for each activity. Ensure User Agency's on-site operations are uninterrupted if applicable.
2. Interruption of utility services. Indicate how long utility services will be interrupted.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of elevator and stairs.

5. Locations of proposed dust- and noise-control temporary partitions and means of egress, including for other occupants affected by selective demolition operations.
6. Coordination of User Agency's continuing occupancy of portions of existing building and of User Agency's partial occupancy of completed Work.
7. Means of protection for items to remain and items in path of waste removal from building.

B. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged, and turned over to the User Agency.

C. Predemolition Videotapes: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by selective demolition operations. Comply with Division 01. Submit before Work begins.

D. Landfill Records: Provide trip tickets (receipts) indicating receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1. Comply with submittal requirements in Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

1.6 QUALITY ASSURANCE

A. Examination of Existing Conditions: The Contractor shall examine the Contract Drawings for demolition and removal requirements and provisions for new work. Verify all existing conditions and dimensions before commencing work. The Contractor shall visit the site and examine the existing conditions as he finds them and shall inform herself/himself of the character, extent and type of demolition and removal work to be performed. Submit any questions regarding the extent and character of the demolition and removal work in the manner and within the time period established for receipt of such questions during the bidding period.

B. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Standards: Comply with ANSI A10.6 and NFPA 241.

E. Predemolition Conference: Conduct conference at Project site to comply with requirements in Section 013100 - PROJECT MANAGEMENT AND COORDINATION. Review methods and procedures related to selective demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.7 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Designer.

E. Engage a professional engineer registered in the Commonwealth of Massachusetts to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of preconstruction videos.

1. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

G. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Arrange to shut off indicated utilities with utility companies and User Agency.
2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing. Where entire wall is to be removed, existing services/systems may be removed with removal of the wall.
4. Prior to commencing cutting work in existing surfaces, take all precautionary measures to assure that mechanical and electrical services to the particular area have been made inactive. Coordinate with Plumbing, HVAC, and Electrical subcontractors. Only licensed tradesmen of that particular trade shall disconnect and cap existing mechanical and electrical items that are to be removed, abandoned and/or relocated.
5. If, during the process of cutting work, existing utility lines are encountered which are not indicated on the Drawings, regardless of their condition, immediately report such items to the Designer. Do not proceed with work in such areas until instructions are issued by the Designer. Continue work in other areas.

3.3 PREPARATION

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Comply with requirements for access and protection specified in Section 015000 - TEMPORARY FACILITIES AND CONTROLS.
2. Maintain adequate passage to and from all exits at all times. Before any work is done which significantly alters access or egress patterns, consult with the Designer and obtain approval of code required egress. Under no condition block or interfere with the free flow of people at legally required exits, or in any way alter the required condition of such exits.

B. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.
2. Remove temporary shoring, bracing and structural supports when no longer required.
3. Post warning signs and place barricades as applicable during placement and removal of temporary shoring.

C. Conduct demolition operations to prevent injury to people and damage to adjacent buildings and facilities to remain. Ensure safe passage of people around demolition area(s).

1. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction. Provide temporary barricades as required to limit access to demolition areas.
2. Protect existing site improvements, appurtenances, and landscaping to remain.

D. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during and after flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

B. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to User Agency.
4. Transport items to storage area designated by the DCAMM Project Manager.
5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Designer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

E. Items for Re-use and Preservation of Existing Surfaces to Remain:

1. The Contractor shall inspect closely each item specifically designated to be relocated, re-used, or turned over to the Owner prior to its removal, and immediately report damages and defects to the Designer and DCAMM Project Manager. The Contractor shall be responsible for any subsequent damage to the same other than latent defects not readily apparent from close inspection, and shall bear responsibility for its repair or same replacement as directed by the Designer, to the satisfaction of the DCAMM Project Manager.
2. Unless special surface preparation is specified under other Specification Sections, leave existing surfaces that are to remain in a condition suitable to receive new materials and/or finishes.

3.5 PROTECTION OF PUBLIC AND PROPERTY

A. Provide all measures required by federal, state and municipal laws, regulations, and ordinances for the protection of surrounding property, the public, workmen, and Commonwealth's employees during all demolition and removal operations. Measures are to be taken, but not limited to installation of sidewalks, sheds, barricades, fences, warning lights and signs, trash chutes and temporary lighting.

B. Protect all walks, roads, streets, curbs, pavements, trees and plantings, on and off premises, and bear all costs for correcting such damage as directed by the Designer, and to the satisfaction of the DCAMM Project Manager.

C. Demolition shall be performed in such a manner that will insure the safety of adjacent property. Protect adjacent property from damage and protect persons occupying adjacent property from injuries which might occur from falling debris or other cause and so as not to cause interference with the use of other portions of the building, of adjacent buildings or the free access and safe passage to and from the same.

D. Every precaution shall be taken to protect against movement or settlement of the building, of adjacent buildings, structures, sidewalks, roads, streets, curbs and pavements. Provide and

place at the Contractor's own expense, all necessary bracing and shoring in connection with demolition and removal work.

E. Remove portions of structures with care by using tools and methods that will not transfer heavy shocks to existing and adjacent building structures, both internal and external of the particular work area.

F. Provide and maintain in proper condition, suitable fire resistive dust barriers around areas where interior demolition and removal work is in progress. Dust barriers shall prevent the dust migration to adjacent areas. Remove dust barriers upon completion of major demolition and removal in the particular work area.

G. Protect unaltered portions of existing construction, including finishes, furnishings and equipment

H. Provide secure weather protection where demolition has removed a portion of the exterior envelope.

3.6 DISCOVERY OF HAZARDOUS MATERIALS

A. If hazardous materials, such as chemicals, asbestos-containing materials, or other hazardous materials are discovered during the course of the work, cease work in affected area only and immediately notify the Designer and the DCAMM Project Manager of such discovery. Do not proceed with work in such areas until instructions are issued by the Designer. Continue work in other areas.

B. If unmarked containers are discovered during the course of the work, cease work in the affected area only and immediately notify the Designer and the DCAMM Project Manager of such discovery. Do not proceed with work in such areas until instructions are issued by the Designer. Take immediate precautions to prohibit endangering the containers integrity. Continue work in other areas.

3.7 CUTTING

A. Perform all cutting of existing surfaces in a manner which will ensure a minimal difference between the cut area and new materials when patched. Use extreme care when cutting existing surfaces containing concealed utility lines which are indicated to remain and bear full responsibility for repairing or replacement of all such utilities that are accidentally damaged.

B. Provide a flush saw cut edge where pavement, curb and concrete removals abut new construction work or existing surfaces to remain undisturbed.

3.8 BLASTING

A. Blasting shall not be allowed.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Comply with requirements of Section 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL and the following.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.10 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Premises shall be left in a clean condition and ready to accept alteration work and new construction.

END OF SECTION

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes for the following applications:
   a. Slabs-on-grade.
   b. Suspended slabs.
   c. Concrete toppings.
   d. Building walls.
   e. Coordination with and cutting and patching of mechanical and electrical penetrations through cast-in-place concrete.
   f. Concrete-encased conduits.
   g. Equipment Pads.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Install the following items as furnished by the designated Sections:
1. Section 260001 - ELECTRICAL WORK:
   a. Sleeves, anchors, inserts, floor boxes, and similar items for electrical systems.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections: Not Applicable.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 SUBMITTALS

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

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.
2. Indicate amount of fly ash in the mix.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1. Indicate coordination requirements for reinforcement locations with requirements of structural steel, steel joints, and steel deck.

D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer licensed in the Commonwealth of Massachusetts detailing fabrication, assembly, and support of formwork.

1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.
2. Blockouts for Architectural Joint Systems: Indicate blockouts and coordination with architectural joint systems

E. Formwork Inspection: Indicate compliance with approved shop drawings.

F. Anchor Bolt Location: Indicate compliance with approved shop drawings.

G. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

H. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Waterstops.
7. Curing compounds.
8. Floor and slab treatments.
9. Bonding agents.
10. Adhesives.

11. Vapor retarders.
12. Semi-rigid joint filler.
13. Joint-filler strips.
14. Repair materials.

I. Floor surface flatness and levelness measurements to determine compliance with specified tolerances and requirements for applied finishes and materials, except as noted for slope to drains.

J. Field quality-control test and inspection reports.

K. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

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.

D. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specification for Structural Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

G. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete manufacturer.
d. Concrete subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: shall be American-made Portland Cement, free from water soluble salts or alkalis which will cause efflorescence on exposed surfaces. Portland Cement shall be Type II, ASTM C150. Use only one brand of cement for each type of cement throughout project. The Contractor shall be responsible for whatever steps are necessary to insure that no visual variations in color will result in exposed concrete and shall place on order and secure in advance a sufficient quantity of this (these) cement(s) to complete concrete work specified herein.

1. Fly Ash: ASTM C 618
2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal Weight Fine Aggregate: shall be washed, inert, natural sand conforming to ASTM C33 and following additional requirements:

Sieve	Retained Percent

#4	0 - 5
#16	25 - 40
#50	70 - 87
#100	93 - 97

Fineness Modulus	2.80 (Plus/Minus 0.20)
Organic	Plate 2 maximum
Silt	2.0 percent maximum
Mortar Strength	100 percent minimum compression ratio
Soundness	5 percent maximum loss, magnesium sulfate, five cycles

C. Normal Weight Coarse Aggregate: shall be well graded crushed stone or washed gravel conforming to ASTM C33 and the following additional requirements:

Designated Size (inches)	3	2	1-1/2	1	3/4	1/2	3/8
F.M.(+/-0.20)	7.95	7.45	7.20	6.95	6.70	6.10	4.50
Organic	Plate 1 maximum						
Silt	1.0 percent maximum						
Soundness	5 percent maximum loss, magnesium sulfate, five cycles						

Maximum designated sizes for normal weight coarse aggregate to be used in concrete sections shall be as noted below, except that sizes shall also be chosen in conjunction with required clearances.

1. One and one-half inches for sections over ten inches in thickness.
2. One inch for sections more than eight and up to ten inches in thickness.
3. Three-quarter inch for sections more than three and up to eight inches in thickness.

D. Water: shall be from approved source, potable, clean and free from oils, acids, alkali, organic matter and other deleterious material.

E. Admixtures:

1. Water-reducing agent:
   a. WRDA, GCPAT.
   b. Plastocrete 100, Sika Corp.
   c. Master Pozzolith 322, BASF.
   d. Or equal.
   e. Note: Water-reducing agent shall be by same manufacturer as air-entraining agent.
2. Air-entraining agent:
   a. Darex AEA, GCPAT.
   b. Sika Air 260, Sika Corp.
   c. MasterAir VR 10, BASF.
   d. Or equal.
3. Superplasticizer: High-range water-reducer conforming to ASTM C494, Type F or Type G.
4. Admixtures retarding setting of cement in concrete shall not be used without written approval of Designer.

5. Admixtures causing accelerated setting of cement in concrete shall not be used without written approval of Designer.

2.2 CONCRETE MIXTURES

A. The Contractor shall recommend, on the basis of trial mixes and strength curves specified below, design mixes for each type and strength of concrete. The Testing Agency will verify that the proposed mix designs conform to all specification requirements.

B. Sufficient materials for concrete mix design shall be furnished by the Contractor not less than five weeks before use. Duplicate small samples plainly and neatly labeled with source, where proposed to be used, date, and name of collector shall be provided and presented to Testing Agency for permanent reference.

C. Mixes shall be designed in accordance with "Method 1" of ACI 301, and the requirements of this Section. All concrete is normalweight unless specifically designated otherwise; air-dry weight not to exceed 150 lbs. per cubic foot.

D. Limiting values shown below apply for specific strengths of concrete with coarse aggregates less than one and one-half inches unless noted otherwise in TABLE A below.

TABLE A

Minimum Allowable Compressive Strength at 28 day (psi)	Max. Allowable Net Water Content Gallons/Sack*	Minimum Permissible Cement Factor Sacks/Cubic Yard**
4000	5.75	6.00
3000	6.50	5.00

* Maximum; decrease if possible. This represents total water in mix at time of mixing, including free water on aggregate.
** Minimum; increase as necessary to meet other requirements.

E. In all slabs and walls exposed to weather, all concrete shall contain the approved air-entraining admixture as per manufacturer's written instructions, to provide entrained air, by volume, in the cured concrete within 4.5 to 6.5 percent.

F. Water-Reducing Admixture - The approved water-reducing admixture shall be used in all concrete, in accordance with manufacturer's written instructions.

G. Concrete slabs, including slabs on grade, shall have a maximum water cement ratio of 0.45.

H. The approved superplasticizer shall be used in all concrete slabs, including slabs on grade.

I. Water content and cement content of concrete to be used in work shall be based on curve showing relation between water content, cement content, and 7 and 28 day compressive

strengths of concrete made using proposed materials. Curves shall be determined by four or more points, each representing an average of at least three test specimens at each age, and shall have range of values sufficient to yield desired data, including all compressive strengths required by Contract Documents, without extrapolation. Design mix of concrete to be used in work, as determined from curve, shall correspond to following test strengths (TABLE B) obtained in laboratory trial mixtures, but in no case shall resulting mix conflict with limiting values as specified in TABLE A.

TABLE B
Minimum Strength of Lab Trial Mixes (psi)

Design Strength	Trial Mix Strength 7-days	28-days
4000	3800	5000
3000	2700	3750

J. Any deviation from approved mix design, which the Contractor deems desirable under certain project conditions, will not be allowed without written approval of Designer. Cost of any additional testing by Testing Agency associated therewith shall be paid for by the Contractor.

2.3 FORM MATERIALS

A. Construct formwork to shapes, lines, and dimensions required, plumb and straight, secured and braced sufficiently rigid to prevent deformation under load, and sufficiently tight to prevent leakage, all in conformance with ACI Standard 347, “Recommended Practice for Concrete Formwork”.

B. Formwork for exposed concrete shall be;
1. Medium-density plastic overlaid plywood, 5/8” minimum thickness
2. For concealed concrete shall be “Plyform” plywood, 5/8” minimum thickness, or equal.

C. Chamfer Strips:
1. Half-inch, 45 degree poplar wood strips, nailed six inches on center, and installed in inside corners of all forms, unless otherwise directed by Designer.

D. Form Ties and Spreaders:
1. Richmond Tyscrus by Richmond Screw Anchor Co.
2. Superior-ties by Superior Concrete Accessories, Ind.
3. Sure-Grip Ties by Dayton, or equal.
4. Sure-Grip and Shore Co. wire ties shall not be used.
5. Ties for foundation walls shall be snap-ties or type specified above with removal cones and shall incorporate water seal washer.
6. Ties shall be arranged in a symmetrical manner.

E. Form Release Agent:
   1. Non-staining and non-emulsifiable type, or equal approved by Designer.
   2. Form release agent shall be biodegradable and shall not impart any stain to concrete nor interfere with adherence of any material to be applied to concrete surfaces.

2.4 REINFORCEMENT AND ACCESSORIES

A. Reinforcing Steel Bars: shall be newly rolled billet steel conforming to ASTM A615 Grade 60. Bars shall be bent cold.

B. Welded Wire Fabric: shall conform to ASTM A185.

C. All structural steel reinforcement and embedded items shall be hot-dip galvanized after fabrication in accordance with ASTM A123.

D. All hot-dip galvanized steel shall be inspected for compliance with ASTM A123 and shall be marked with a stamp that indicates the number of ounces of zinc per square foot of steel. After galvanizing, the bars shall be dipped in a 0.2 percent chromic acid solution. A notarized Certificate of Compliance with all of the above shall be required from the galvanizer.

E. Reinforcement Accessories: shall conform to Product Standard PS7-766, National Bureau of Standards, Department of Commerce, Class C, as produced by Dayton Superior Co., R.K.L. Building Specialties Co., Inc., or equal. Reinforcement accessories shall include spacers, chairs, ties, slab bolsters, clips, chair bars, and other devices for properly assembling, placing, spacing, supporting, and fastening reinforcement. Tie wire shall be galvanized or stainless wire of sufficient strength for intended purpose, but not less than No. 18 gage. Metal supports shall be of such type as not to penetrate surface of formwork and show through surface of concrete. Accessories touching interior formed surfaces exposed to view shall have not less than 1/8 inch of plastic between metal and concrete surface. Plastic tips shall extend not less than 1/2 inch up on metal legs. Individual and continuous slab bolsters and chairs shall be of type to suit various conditions encountered and must be capable of supporting 300 pound load without damage or permanent distortion.

2.5 MISCELLANEOUS MATERIALS

A. Grout: shall be ready-to-use metallic aggregate product requiring only addition of water at job site such as MasterFlow 885 by BASF, Vibro-Foil Ready-Mixed by GCPAT, Ferrolith G by Sonneborn, or equal. Grout shall be easily workable and shall have no drying shrinkage at any age. Compressive strength of grout (2" x 2" cubes) shall not be less than 5000 psi at 7 days, and 7500 psi at 28 days.

B. Vapor Retarder: Minimum 10 mil polyethylene, unless specifically specified elsewhere.

C. Membrane Curing Compound: Conform to ASTM C309, Type 1. Product used shall be shown to be compatible with the later application of coatings. Curing compound shall not be used on any floor slab scheduled to receive an adhered floor finish.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine all work prepared by others to receive work of this Section and report any defects affecting installation to the Contractor for correction. Commencement of work will be construed as complete acceptance of preparatory work by others.

1. Inspection shall be performed by a structural engineer licensed in the Commonwealth of Massachusetts. Certify compliance with shop drawings.

3.2 HANDLING, STORAGE, AND PROTECTION OF MATERIALS

A. Handle and store materials separately in such manner as to prevent intrusion of foreign matter, segregation, or deterioration. Do not use foreign materials or those containing ice. Remove improper and rejected materials immediately from point of use. Cover materials, including steel reinforcement and accessories, during construction period. Stockpile concrete constituents properly to assure uniformity throughout project.

3.3 ERECTION OF FORMWORK, SHORING AND RESHORING

A. Set and maintain formwork to insure complete concrete work within tolerance limits listed in ACI 347 latest edition, "Recommended Practice for Concrete Formwork", and with following additional requirements:

1. Maximum variations from plumb:
    a. In surfaces of columns and walls:
        1) In any 10 feet of length: 1/4 inch
        2) Maximum for entire length: 1/2 inch
2. Maximum variations from established position in plan shown on the drawings:
    a. Column: 1/2 inch
    b. Walls: 3/4 inch
3. Variations in cross-sectional dimensions of columns and beams and in thickness of slabs and walls.
    a. Minus: 1/8 inch
    b. Plus: 1/4 inch

B. For a minimum of one hour prior to concrete placement, wet forms continuously with water to swell forms in order to prevent leakage of concrete matrix and to minimize absorption of concrete matrix water by form materials. This requirement may be waived for those specific cases where Designer deems it unnecessary or impractical. Care must be exercised to prevent a build-up of water at base of forms.

C. Before form materials can be re-used, surfaces that will be in contact with freshly cast concrete shall be thoroughly cleaned, damaged areas repaired and projecting nails withdrawn. Re-use of form material shall be subject to approval by Designer.

3.4 PLACING OF REINFORCEMENT

A. Reinforcement shall be placed in accordance with requirements of CRSI 93, "Recommended Practice for Placing Reinforcing Bars" and CRSI 93, "Recommended Practice for Placing Bar Supports" and with further requirements below.

B. Reinforcement shall be accurately placed in accordance with Contract Documents and shall be firmly secured in position by wire ties, chairs, spacers, and hangers, each of type approved by Designer.

C. Bending, welding or cutting reinforcement in field in any manner other than as shown on Drawings, is prohibited, unless specific approval for each case is given by Designer.

D. Reinforcement shall be continuous through construction joints unless otherwise indicated on Drawings.

E. Reinforcement shall be spliced only in accordance with requirements of Contract Documents or as otherwise specifically approved by Designer. Splices of reinforcement at points of maximum stress shall generally be avoided. Welded wire fabric shall lap six inches or one space plus two inches whichever is larger, and shall be wired together.

F. At time concrete is placed, reinforcement shall be free of excessive rust, scale, or other coatings that will destroy or reduce bond requirements. Reinforcement expected to be exposed to weather for a considerable length of time shall be painted with a heavy coat of cement grout. Protect stored materials so as not to end or distort bars in any way. Bars that become damaged will be rejected.

G. Before concrete is cast, check all reinforcement after it is placed to insure that reinforcement conforms to Contract Documents and approved Shop Drawings. Such checking shall be done only by qualified experienced personnel. In addition, the Designer shall be notified at least 36 hours prior to concrete placement and given opportunity to inspect completed reinforcement and formwork before concrete placement. Prior approval of Shop Drawings shall in no way limit Designer's right to demand modifications or additions to reinforcement or accessories.

3.5 JOINTS

A. Construction and control joints indicated on Drawings are mandatory and shall not be omitted.

B. Joints not indicated or specified shall be placed to least impair strength of structure and shall be subject to approval of Designer.

3.6 INSTALLATION OF EMBEDDED ITEMS

A. Conform to requirements of ACI 318, paragraph 6.3, "Conduits and Pipes Embedded in Concrete", and as specified below.

B. Install steel sleeves, embedded wall plates and similar items, furnished by other trades, at locations shown on the drawings.

C. Anchor bolts for column base plates shall be installed with templates provided. Vertical alignment and plan locations shall be maintained within one-sixteenth inches of the locations shown on the drawings.

1. Inspection shall be performed by a surveyor licensed in the Commonwealth of Massachusetts. Certify compliance with shop drawings.

3.7 MIXING, CONSISTENCY, AND DELIVERY OF CONCRETE

A. Concrete shall be ready-mixed, produced by plant acceptable to Designer. Hand or site mixing shall not be done. Constituents, including admixtures except certain corrosion inhibitors and superplasticizers, shall be batched at central batch plant. Admixtures shall be premixed in solution form and dispensed as recommended by manufacturer.

B. Central plant and rolling stock equipment and methods shall conform with Truck Mixer and Agitator Standard of Truck Mixer Manufacturer's Bureau of National Ready-Mixed Concrete Association, and Contract Documents. Consistency of concrete at time of deposit shall be as follows:

1. Portion of Structure;
   a. Walls, columns, Slabs, beams

2. Slump Recommended;
   a. 3”
   b. 4”

3. Max. Range,
   a. 3" - 5"
   b. 2" - 4"

C. Ready mixed concrete shall be transported to site in watertight agitator or mixer trucks loaded not in excess of rated capacities. Discharge at site shall be within one and one-half hours after cement was first introduced into mix. Discard cement not discharged within one and one-half hours and dispose of legally. Concrete with a temperature greater than 85 degrees F. shall not be placed. Central mixed concrete shall be plant mixed a minimum of five minutes. Agitation shall begin immediately after premixed concrete is placed in truck and shall continue without interruption until discharged. Transit mixed concrete shall be mixed at mixing speed for at least ten minutes immediately after charging truck followed by agitation without interruption until discharged. Concrete shall be furnished by a single plant unless accepted by the Designer in writing.

D. Retempering of concrete which has partially hardened, that is, mixing with or without additional cement, aggregates, or water, will not be permitted.

3.8 PLACING CONCRETE

A. Intent of this Specification is that concrete shall not be pumped. Refer to "Submittals and Concrete Constituents" in this Section for requirements should pumping be proposed.

B. Remove water and foreign matter from forms and excavations and, except in freezing weather or as otherwise directed, thoroughly wet wood forms just prior to placing concrete. Place no concrete on frozen soil and provide adequate protection against frost action during freezing weather.

C. To secure full bond at construction joints, surfaces of concrete already placed, including vertical and inclined surfaces, shall be thoroughly cleaned of foreign materials and laitance, roughened with suitable tools such as chipping hammers or wire brushes, and recleaned by stream of water or compressed air. Well before new concrete is deposited, joints shall be saturated with water. After free or glistening water disappears joints shall be given thorough coating of neat cement slurry mixed to consistency of very heavy paste. Surface shall receive coating of approximately one-eighth inch thick; this shall be scrubbed in by means of stiff bristle brushes. New concrete shall be deposited before neat cement dries or changes color.

D. Do not place concrete having slump outside of allowable slump range.

E. Transport concrete from mixer to place of final deposit as rapidly as practical by methods which prevent separation of ingredients and displacement of reinforcement, and which avoid rehandling. Deposit no partially hardened concrete. When concrete is conveyed by chutes, equipment shall be of such size and U-shaped design as to insure continuous flow in chute. Flat (coal) chutes shall not be employed. Chutes shall be of metal or metal lines and different portions shall have approximately same slope. Slope shall not be less than 25 degrees nor more than 45 degrees from horizontal and shall be such as to prevent segregation of ingredients. Discharge end of chute shall be provided with baffle plate or spout to prevent segregation. If discharge end of chute is more than five feet above surface of concrete in forms, spout shall be used, and lower and maintained as near surface of deposit as practicable. When operation is intermittent, chute shall discharge into hopper. Chute shall be thoroughly cleaned before and after each run and debris and any water used shall be discharged outside forms. Concrete shall not be allowed to flow horizontally over distances exceeding five feet.

F. Concrete shall be placed in such manner as to prevent segregation, and accumulations of hardened concrete on forms or reinforcement above mass of concrete being placed. To achieve this end, suitable hoppers, spouts with restricted outlets and tremies shall be used as required.

G. During and immediately after depositing, concrete shall be thoroughly compacted by means of internal type mechanical vibrators or other tools, or by spading to produce required quality of finish. Vibration shall be done by experienced operators under close supervision and shall be carried on only enough to produce homogeneity and optimum consolidation without permitting segregation of constituents or "pumping" of air. Vibrators used for normalweight concrete shall operate at speed at not less than 7,000 vpm and be of suitable capacity. Do not use vibrators to

move concrete. Vibration shall be supplemented by proper wooden spade puddling to remove included bubbles and honeycomb adjacent to visible surfaces. At least one vibrator shall be on hand for every 10 cubic yards of concrete placed per hour, plus one spare. Vibrators shall be operable and on site prior to starting placement.

H. Vertical lifts shall not exceed 18 inches. Vibrate completely through successive lifts to avoid pour lines. Vibrate first lift thoroughly until top of lift glistens to avoid stone pockets, honeycomb, and segregation.

I. Concrete shall be deposited continuously, and in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause formation of seams and planes of weakness within section. If section cannot be placed continuously between planned construction joints, as specified, field joint and additional reinforcement shall be introduced so as to preserve structural continuity. Designer shall be notified in any such case.

J. Cold joints, particularly in exposed concrete, including "honeycomb", are unacceptable. If they occur in concrete surfaces exposed to view, Designer will require that entire section in which blemish occurs be removed and replaced with new materials at the Contractor's expense.

K. When placing exposed concrete walls or columns, strike corners of forms rapidly and repeatedly from outside along full height while depositing concrete and vibrating.

L. Chutes, hoppers, spouts, adjacent work, etc. shall be thoroughly cleaned before and after each run and water and debris shall be discharged outside form.

3.9 FINISHING OF UNFORMED CONCRETE SURFACES

A. Smooth troweled finish: shall be provided where concrete flatwork is to be exposed in the finished work or is to receive resilient flooring materials.

B. Floated finish: shall be provided where concrete flatwork is to receive waterproofing membranes or setting beds for finished materials.

C. Floated finish: shall be provided for top surfaces of walls, slabs and beams.

D. Rough struck surface shall be provided at top of pedestals.

E. Steel Broom Finish (with smooth edging): shall be provided at exterior concrete walks, pavements and steps.

F. The Contractor, at his own expense, shall level depressed spots and grind high spots in concrete surfaces which are in excess of specified tolerances. Leveling materials proposed for providing proper surface shall be approved by Designer.

3.10 REPAIRING OF UNFORMED CONCRETE SURFACES

A. Tops of slabs and walls shall be repaired by using either same material as originally cast or by use of dry-pack material, as approved by Designer. Areas affected shall be chipped back square and to depth of one inch minimum. Hole shall then be moistened with water for a minimum of two hours, followed by brush coat of 1/16 inch thick cement paste. Immediately plug hole with concrete, or with dry pack material consisting of 1:1.5 mixture of cement and concrete sand mixed slightly damp to touch. Hammer dry-pack into hole until dense, and excess paste appears on surface. Finish patch flush and to same texture as surrounding concrete. For large repairs employ 1-1-2 mixture of cement, concrete sand and pea gravel at same dry-pack consistency.

3.11 CURING AND PROTECTION

A. When concrete is placed at or below ambient air temperatures of 40 degrees F. or whenever in opinion of Designer, such or lower temperatures are likely to occur within 48 hours after placement of concrete, cold weather concreting procedures, according to ACI 306 and as specified herein, shall be followed. To this end, entire area affected shall be protected by adequate housing or covering, and heating. No salt, chemicals or other foreign materials shall be used in the mix to lower freezing point of concrete.

B. Protect concrete work against injury from heat, cold, and defacement of any nature during construction operations.

C. Concrete shall be treated and protected immediately after concreting or cement finishing is completed, to provide continuous moist curing above 50 degrees F. for at least seven days, regardless of ambient air temperatures.

D. Curing compounds will not be permitted for slab and beams.

E. Keep permanent temperature record showing date and outside temperature for concreting operations. Thermometer readings shall be taken at start of work in morning, at noon, and again late in afternoon. Locations of concrete placed during such periods shall likewise be recorded, in such manner as to show any effect temperatures may have had on construction. Copies of temperature record shall be distributed daily to Designer.

3.12 REMOVAL OF FORMWORK, SHORING AND RESHORING

A. The Contractor shall be responsible for proper removal of formwork, shoring, and reshoring.

B. Forms shall be removed only after concrete has attained sufficient strength to support its shown weight, construction loads to be placed thereon and lateral loads, without damage to structure or excessive deflection.

C. Forms and supports shall remain in place for not less than minimum periods of time noted below. These periods represent cumulative number of days or fractions thereof, consecutive unless otherwise approved by Designer during which time mean daily air temperature at surfaces of concrete is above 50 degrees F.

1. Vertical Surfaces: concrete shall have reached 100 day-degrees# and shall have attained strength of not less than 30 percent of f'c. Where such forms also support formwork for slab or beam soffits, removal times for latter shall govern.
2. Horizontal Surfaces: except as noted below, concrete shall have reached 300 day-degrees of curing and attained strength of not less than 60 percent of f'c.
    a. Soffits of beams or girders shall remain supported and in place until concrete has attained 600 day-degrees#.
    b. Forms and supports of floor slabs shall remain in place until concrete has reached 400 day-degrees.
    c. Definition of day-degrees: Total number of days times mean daily air temperature at surfaces of concrete. For example, five days at temperature of 60 degrees F. equals 300 day degrees. Days or fractions of days in which temperature is below 50 degrees F. shall not be included in calculation of day-degrees.

D. Form removal shall be so performed that reshores are placed at same time as stripping operations, and that no area larger than one-fourth of a slab panel is unsupported at any time.

E. Any test cylinders required to verify the specified minimum strengths for form removal shall be field cured under the same conditions as the concrete they represent. Such cylinders and testing shall be at the Contractor's expense.

3.13 REPAIRING AND FINISHING OF FORMED AND ARCHITECTURAL CONCRETE SURFACES

A. In accordance with the provisions of ACI 301, Chapter 10, all concrete shall have "smooth form finish".

B. Intent of this Specification is to require forms, mixtures of concrete, and workmanship so that concrete surfaces will require no patching, except for plugging of tie holes. However, where patching is acceptable to Designer, procedure described below shall be followed.

C. Defective concrete and honeycombed areas shall not be patched unless examined and approval is given by Designer. If such approval is received by the Contractor, areas involved shall be chipped down square and at least one inch deep to sound concrete by means of cold chisels or pneumatic chipping hammers. If honeycomb exists around reinforcement, chip to provide clear

space at least three-quarter inch wide all around steel to afford proper ultimate bond thereto. For areas less than one and one-half inches deep, patch shall be made in same manner as described above for filling unformed concrete surfaces, care being exercised to use crumbly-dry (non-trowelable) mixtures and to avoid sagging. Thicker repairs shall require build-up in successive days, each layer being applied as described. To aid strength and bonding of multiple layer repairs, non-shrink, non-metallic aggregate shall be used as an additive as follows:

Materials	Volumes	Weights
Cement	1.0	1.0
Non-Metallic Aggregate	0.15	0.25
Sand	1.5	1.55

For very heavy (generally, formed) patches, pea gravel may be added to mixture and proportions modified as follows:

Materials	Volumes	Weights
Cement	1.0	1.0
Non-Metallic Aggregate	0.2	0.33
Sand	1.0	1.0
Pea Gravel	1.5	1.55

After hardening, rub lightly as described above for form tie holes.

1. Mortar for patching shall be same mix as above except aggregate shall pass a No. 14 sieve.
2. For all concrete to receive "smooth" finish, remove formwork fins and clean entire surface of grease, form oil, laitance, dust, and other foreign matter.
3. "Smooth" finish shall consist of having all fins removed, joint marks smoothed off, blemishes removed, and surfaces left smooth and unmarred.
4. Begin finishing operations as soon as practicable after removal of forms, continue with curing operations after finishing is completed. After concrete has been well cured, carefully inspect surfaces. Remove any fins, rough spots, streaks, hardened mortar or grout and other foreign material. Patch defects with finishing mortar as specified above, to satisfaction of Designer.

D. Patches which become crazed, cracked, or sound hollow upon tapping shall be removed and replaced with new material at the Contractor's expense.

3.14 FIELD QUALITY CONTROL

A. Independent Testing Agency: Cooperate with the Independent Testing Agency engaged by the Owner for field quality control activities for the Work of this Section. Refer also to Section 014325 - TESTING AGENCY SERVICES.

B. Commissioning Authority: Cooperate with the Commissioning Authority engaged by the Owner for field quality control activities for the Work of this Section.

C. Cooperate with field quality control personnel. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.

D. Additional inspections and retesting of materials which fail to comply with specified material and installation requirements shall be performed at the Contractor's expense.

3.15 CLEANING

A. Concrete surfaces shall be cleaned of objectionable stains as determined by the Designer. Materials containing acid in any form or methods which will damage "skin" of concrete surfaces shall not be employed, except where otherwise specified.

END OF SECTION

SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Requirements applicable to all Division 26 Sections, including Section 26 00 01.

1. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SECTION INCLUDES

A. Formed steel stud interior wall framing.

B. Interior wall sheathing.

1.3 RELATED REQUIREMENTS

A. Section 09 21 16 - Gypsum Board Assemblies: Interior, cold-formed steel nonstructural framing.

1.4 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).

B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.

G. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

H. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.5 SUBMITTALS

A. Product Data: Provide data on cold-formed steel structural members; include material descriptions and base steel thickness.

B. Steel Framing Industry Association (SFIA) Certification:

1. Submit documentation that metal studs and connectors used on project meet or exceed requirements of International Building Code.
2. Design Data:
    a. Shop drawings signed and sealed by a professional structural engineer.
3. Design calculations sufficient to demonstrate compliance with design criteria; signed and sealed by a professional structural engineer.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Design Requirements: Design cold-formed framing systems, components and connectors to withstand specified design loads in compliance with ICC (IBC), ASCE 7, AISI S100, and AISI S240.

B. Regulatory Requirements: Comply with applicable building code criteria for loads, including seismic loads.

1. Live load deflection meeting the following, unless otherwise indicated:
2. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
3. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

2.2 MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.

1. Structural Grade: As required to meet design criteria.
2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.

2.3 STRUCTURAL FRAMING COMPONENTS

A. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.

2.4 MISCELLANEOUS CONNECTIONS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized per ASTM A153/A153M.

2.5 SHEATHING

A. Glass-mat-faced gypsum board; ASTM C1177/C1177M, square long edges, 5/8 inch thick, Type X - fire-resistant.

2.6 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. Install structural members and connections in compliance with ASTM C1007.

3.2 INSTALLATION OF STUDS

A. Install wall studs plumb and level.

B. Provide deflection allowance in stud track, directly below horizontal building framing at non-loadbearing framing.

3.3 INSTALLATION OF WALL SHEATHING

A. Install wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Requirements applicable to all Division 26 Sections, including Section 26 00 01.
   1. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Joint backings and accessories.

1.3 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).

B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical datasheets for each product to be used; include 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. Backing material recommended by sealant manufacturer.

4. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
5. Substrates the product should not be used on.

B. 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.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.

1.5 QUALITY ASSURANCE

A. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
1. Adhesion Testing: In accordance with ASTM C794.
2. Compatibility Testing: In accordance with ASTM C1087.
3. Allow sufficient time for testing to avoid delaying the work.
4. Deliver sufficient samples to manufacturer for testing.
5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

B. Field Adhesion Test Procedures:
1. Allow sealants to fully cure as recommended by manufacturer before testing.
2. Have a copy of the test method document available during tests.
3. Record the type of failure that occurred, other information required by test method, and the information required on the Field Quality Control Log.
4. If any combination of sealant type and substrate does not show evidence of minimum adhesion or shows cohesion failure before minimum adhesion, report results to Architect.

PART 2 - PRODUCTS

2.1 NONSAG JOINT SEALANTS

A. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 35 percent, minimum.
   2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
   3. Color: To be selected by Architect from manufacturer's standard range.
   4. Products:
      a. Master Builders Solutions; MasterSeal NP1:
         1) www.master-builders-solutions.com/en-us/#sle.
      b. Sika Corporation; Sikaflex-1a:
         1) www.usa.sika.com/#sle.
      c. Tremco Commercial Sealants & Waterproofing; Dymonic 100:
         1) www.tremcosealants.com/#sle.

2.2 ACCESSORIES

A. Sealant Backing Materials, General: Materials placed in joint before applying sealants; assists sealant performance and service life by developing optimum sealant profile and preventing three-sided adhesion; type and size recommended by sealant manufacturer for compatibility with sealant, substrate, and application.

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, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 - EXECUTION

3.1 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.

3.2 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Install bond breaker backing tape where backer rod cannot be used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

E. 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.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Requirements applicable to all Division 26 Sections, including Section 26 00 01.

1. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Fire-rated hollow metal doors and frames.

1.3 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

B. Section 09 91 23 - Interior Painting: Field painting.

1.4 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2022.

C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.

D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.

G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.

H. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.

I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

J. ITS (DIR) - Directory of Listed Products; current edition.

K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

M. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.

N. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

O. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

P. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

Q. UL (DIR) - Online Certifications Directory; Current Edition.

R. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.5 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:

1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM

A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.

2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Door Edge Profile: Manufacturers standard for application indicated.
4. Typical Door Face Sheets: Flush.
5. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
6. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.2 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Interior Doors, Non-Fire-Rated:

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 3 - Extra Heavy-duty.
   b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 1 - Full Flush.
   d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
   e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Door Thickness: 1-3/4 inches, nominal.

C. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 16 gauge, 0.053 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      a. Attach fire rating label to each fire rated unit.
   4. Door Thickness: 1-3/4 inches, nominal.

2.3 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.

C. Door Frames, Fire-Rated: Full profile/continuously welded type.
   1. Fire Rating: Same as door, labeled.
   2. Frame Metal Thickness: 14 gauge, 0.067 inch, minimum.

2.4 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.2 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Install door hardware as specified in Section 08 71 00.

3.3 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.5 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Requirements applicable to all Division 26 Sections, including Section 26 00 01.

1. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Gypsum wallboard.

D. Joint treatment and accessories.

1.3 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Interior and exterior wall framing.

1.4 REFERENCE STANDARDS

A. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.

B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).

C. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

D. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.

E. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).

F. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

G. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.

H. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.

I. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

J. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

K. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.

1.5 SUBMITTALS

A. Product Data:

1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.
2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

PART 2 - PRODUCTS

2.1 METAL FRAMING MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.

B. Nonstructural Framing System Components: AISI S220; 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/360 at 5 psf.

1. Studs: C-shaped with knurled or embossed faces.
2. Runners: U shaped, sized to match studs.

C. Shaft Wall Studs and Accessories: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.

2.2 BOARD MATERIALS

A. 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 and ceilings, unless otherwise indicated.
2. Thickness:

a. As indicated on drawings.

3. Paper-Faced Products:
    a. CertainTeed Corporation; Type C Drywall: www.certainteed.com/#sle.
    b. Georgia-Pacific Gypsum; ToughRock Fireguard C: www.gpgypsum.com/#sle.
    c. USG Corporation; Sheetrock Brand Firecode C Panels: www.usg.com/#sle.

B. Shaftwall and Coreboard: Type X; 1 inch thick by 24 inches wide, beveled long edges, ends square cut.
1. Paper-Faced Type: Gypsum shaftliner board or gypsum coreboard as defined ASTM C1396/C1396M; water-resistant faces.
2. Paper-Faced Products:
    a. CertainTeed Corporation; M2Tech Type X Shaftliner: www.certainteed.com/#sle.
    b. Georgia-Pacific Gypsum; ToughRock Shaftliner: www.gpgypsum.com/#sle.
    c. USG Corporation; Sheetrock Brand Gypsum Liner Panels 1 in. (25.4 mm) SLX: www.usg.com/#sle.

2.3 GYPSUM BOARD ACCESSORIES

A. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
1. Types: As detailed or required for finished appearance.

B. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

C. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches in Thickness and Wood Members: ASTM C1002; self-piercing tapping 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 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.

B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.

3.3 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C1007AISI S220 and manufacturer's instructions.

B. Studs: Space studs at 16 inches on center.

1. Extend partition framing to structure where indicated and to ceiling in other locations.
2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

3.4 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

D. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.5 INSTALLATION OF TRIM AND ACCESSORIES

A. Corner Beads: Install at external corners, using longest practical lengths.

B. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.6 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 4: Walls and ceilings.

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.

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 65 00

RESILIENT FLOORING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Requirements applicable to all Division 26 Sections, including Section 26 00 01.
   1. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SECTION INCLUDES

A. Resilient tile flooring.

B. Resilient base.

C. Installation accessories.

1.3 REFERENCE STANDARDS

A. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2023.

B. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.

C. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2018.

PART 2 - PRODUCTS

2.1 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness.
   1. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
   2. Size: 12 by 12 inch.
   3. Thickness: 0.125 inch.
   4. Color: To be selected by Architect from manufacturer's full range.

2.2 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TV, vinyl, thermoplastic; Style B, Cove.
   1. Height: 4 inches.
   2. Thickness: 0.125 inch.

3. Finish: Satin.

2.3 ACCESSORIES

A. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

B. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).

B. Clean substrate.

3.2 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

3.3 INSTALLATION - TILE FLOORING

A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

3.4 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

END OF SECTION

SECTION 09 67 00

FLUID-APPLIED FLOORING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Requirements applicable to all Division 26 Sections, including Section 26 00 01.
   1. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SECTION INCLUDES

A. Fluid-applied flooring and base.

1.3 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.

B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2023.

C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available; and _____.

C. Samples: Submit two samples, 4 by 4 inch in size illustrating color and pattern for each floor material for each color specified.

D. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and application rate for each coat.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the work of this section.

1. Minimum five years of documented experience.

PART 2 - PRODUCTS

2.1 FLUID-APPLIED FLOORING SYSTEMS

A. Fluid-Applied Flooring: Epoxy base coat(s), polyurethane top coat, no aggregate.

1. System Thickness: 40 mils, nominal, dry film thickness (DFT).
2. Texture: Smooth.
3. Sheen: Matte.
4. Color: As selected by Architect.
5. Products:
   a. Sherwin-Williams Company; Armorseal 100% Solids Epoxy/Polyurethane: www.protective.sherwin-williams.com/#sle.
   b. Sika Corporation; Merflex: www.sikafloorusa.com/#sle.
   c. TNEMEC; Power-Tred: www.tnemec.com/#sle.

2.2 ACCESSORIES

A. Cant Strips: Molded of flooring resin material.

B. Subfloor Filler: Type recommended by fluid-applied flooring manufacturer.

C. Primer and/or vapor retarder: Type recommended by fluid-applied flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

B. Cementitious Subfloor Surfaces: Verify that substrates are ready for fluid-applied flooring installation by testing for moisture and alkalinity (pH).

1. Test as Follows:
   a. Alkalinity (pH): ASTM F710.

b. Internal Relative Humidity: ASTM F2170.

c. Moisture Vapor Emission: ASTM F1869.

2. Obtain instructions if test results are not within limits recommended by fluid-applied flooring manufacturer.

3.2 PREPARATION

A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.

C. Vacuum clean substrate.

D. Apply primer to surfaces required by flooring manufacturer.

3.3 INSTALLATION - ACCESSORIES

A. Install cant strips at base of walls where flooring is to be extended up wall as base.

3.4 INSTALLATION - FLOORING

A. Apply in accordance with manufacturer's instructions.

B. Apply each coat to minimum thickness required by manufacturer.

C. Finish to smooth level surface.

D. Cove at vertical surfaces.

3.5 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

END OF SECTION

SECTION 09 91 23

INTERIOR PAINTING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Requirements applicable to all Division 26 Sections, including Section 26 00 01.
   1. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification 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. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.

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. Floors, unless specifically indicated.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

1.3 RELATED REQUIREMENTS

A. Section 09 67 00 - Fluid-Applied Flooring: Coating of concrete flooring.

1.4 REFERENCE STANDARDS

A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

B. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

C. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.

1.5 SUBMITTALS

A. 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 products to be used in project; include description of each system.
4. Manufacturer's installation instructions.

1.6 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.

1.7 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. Provide lighting level of 80 fc measured mid-height at substrate surface.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

2.2 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
   1. 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.
   2. Supply each paint material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

2.3 PAINT SYSTEMS - INTERIOR

A. Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board and concrete masonry units.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Institutional Low Odor/VOC Interior Latex; MPI #143, 144, 145, 146, 147, or 148.
      a. Products:
         1) PPG Paints Speedhide Zero Interior Latex, 6-5310 Series, Ivory.
         2) Sherwin-Williams ProMar 200 Zero VOC Interior Latex, Low Sheen. (MPI #144), Ivory Lace, SW 7013.

B. Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals:
   1. Medium duty applications include metal doors and door frames.
   2. Two top coats and one coat primer.

3. Top Coat(s): Interior Alkyd, Water Based; MPI #157, 167, 168, or 169.
    a. Products:
        1) PPG Paints Speedhide Interior/Exterior WB Alkyd, 6-1510XI Series, Semi-Gloss.
        2) Sherwin-Williams ProMar 200 Waterbased Acrylic-Alkyd, Semi-Gloss.

2.4 PRIMERS

A. Primers: Provide primer as recommended by manufacturer of top coats.

2.5 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.

C. Fastener Head Cover Material: Latex filler.

PART 3 - EXECUTION

3.1 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. Masonry:
    1. Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
    2. Prepare surface as recommended by top coat manufacturer.

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. Re-prime entire shop-primed item.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. Protect from corrosion until coated.

3.2 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. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.3 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.4 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 22 05 05

PLUMBING DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Mechanical Demolition.

B. Cutting and Patching.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF WORK AND DO NOT SHOW EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO SUBMITTING A BID.

B. Where walls, ceilings, etc., are shown as being removed on general drawings, the Contractor shall remove all mechanical equipment, devices, fixtures, piping, ducts, systems, etc., from the removed area.

C. Where ceilings, walls, partitions, etc., are temporarily removed and replaced by others, This Contractor shall remove, store, and replace equipment, devices, fixtures, pipes, ducts, systems, etc.

D. Verify that abandoned utilities serve only abandoned equipment or facilities. Extend services to facilities or equipment that shall remain in operation following demolition.

E. Coordinate work with all other Contractors and the Owner. Schedule removal of equipment to avoid conflicts.

F. This Contractor shall verify all existing equipment sizes and capacities where equipment is scheduled to be replaced or modified, prior to ordering new equipment.

G. Bid submittal shall mean the Contractor has visited the project site and verified existing conditions and scope of work.

3.2 PREPARATION

A. Disconnect plumbing systems in walls, floors, and ceilings scheduled for removal.

B. Provide temporary connections to maintain existing systems in service during construction. When work must be performed on operating equipment, use personnel experienced in such operations.

3.3 Existing Plumbing System: Maintain service to all plumbing fixtures until new piping is installed. Obtain permission from Owner at least 48 hours before shutting down system for any reason. Make changeover to new piping with minimum outage. Do not disconnect any roof drainage piping until new piping is in place and operational. DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

A. Demolish and extend existing plumbing work under provisions of Division 2 and this Section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned piping to source of supply and/or main lines.

D. Remove exposed abandoned pipes, including abandoned pipes above accessible ceilings. Cut pipes above ceilings, below floors and behind walls. Cap remaining lines. Repair building construction to match original. Remove all clamps, hangers, supports, etc. associated with pipe and duct removal.

E. Disconnect and remove mechanical devices and equipment serving equipment that has been removed.

F. Repair adjacent construction and finishes damaged during demolition and extension work.

G. Extend existing installations using materials and methods compatible with existing installations, or as specified.

H. Remove unused sections of domestic water piping back to mains and cap. Capped pipe shall be less than 2 feet from main to prevent "dead legs".

I. Temporarily cap all openings to the sanitary and vent system to prevent odor from entering the work area and building.

3.4 CUTTING AND PATCHING

A. This Contractor is responsible for all penetrations of existing construction required to complete the work of this project. Refer to Section 22 05 29 for additional requirements.

B. Penetrations in existing construction should be reviewed carefully prior to proceeding with any work.

C. Penetrations shall be neat and clean with smooth and/or finished edges. Core drill where possible for clean opening.

D. Repair existing construction as required after penetration is complete to restore to original condition. Use similar materials and match adjacent construction unless otherwise noted or agreed to by the Architect/Engineer prior to start of work.

E. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

3.5 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Clean all systems adjacent to project which are affected by the dust and debris caused by this construction.

C. PLUMBING ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

3.6 SPECIAL REQUIREMENTS

A. Install temporary filter media over outside air intakes which are within 100 feet of the limits of construction[or as noted on the drawings]. This Contractor shall complete any cleaning required for existing systems which are affected by construction dust and debris.

B. Review locations of all new penetrations in existing floor slabs or walls. Determine construction type and review for possible interferences. Bring all concerns to the attention of the Architect/Engineer before proceeding.

END OF SECTION

SECTION 230001
HEATING, VENTILATING, AND AIR CONDITIONING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 00 - PROCUREMENT AND CONHTRACTING REQUIREMENTS and DIVISION 1 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Sub Sub-Bid Requirements:
   1. Sheet Metal
      a. SECTION 235100 - BREECHINGS, CHIMNEYS, AND STACKS

C. Reference Drawings: The electrical work of this bid is shown on the following Contract Drawings:

M000, M101, M201, and M400

D. Reference Specifications:
   1. SECTION 23 05 00 - BASIC HVAC REQUIREMENTS
   2. SECTION 23 05 05 - HVAC DEMOLITION FOR REMODELING
   3. SECTION 23 05 16 - HVAC EXPANSION COMPENSATION
   4. SECTION 23 05 29 - HVAC SUPPORTS AND ANCHORS
   5. SECTION 23 51 00 - BREECHINGS, CHIMNEYS, AND STACKS

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
   1. All Work of the following sections:
      a. SECTION 23 05 00 - BASIC HVAC REQUIREMENTS
      b. SECTION 23 05 05 - HVAC DEMOLITION FOR REMODELING
      c. SECTION 23 05 16 - HVAC EXPANSION COMPENSATION
      d. SECTION 23 05 29 - HVAC SUPPORTS AND ANCHORS
      e. SECTION 23 51 00 - BREECHINGS, CHIMNEYS, AND STACKS
   2. Firestopping for the Work of this Section, including cutting penetrations and firestopping; complying with requirements specified in Section 078413 - PENETRATION FIRESTOPPING.
   3. Core drilling for the Work of this Section.

4. Certified seismic restraints to meet the Commonwealth of Massachusetts Building Code applicable at the time the building permit is issued.
5. Coordination drawings and record drawings and similar requirements.
6. CAMIS excel spreadsheet data collection for Equipment Template and PM Procedure tabs as described in Section 017700 - CONTRACT CLOSEOUT
7. BIM modeling as specified in this Section and in Section 013129 - BIM COORDINATION.

B. Alternates: N/A

C. Items to Be Installed Only: N/A

D. Items to Be Furnished Only: N/A

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:
1. Section 033000 - CAST-IN-PLACE CONCRETE for cutting and patching of concrete walls and for concrete equipment pads, manhole and thrust block requirements.
2. Section 260001 - ELECTRICAL WORK for electrical power to mechanical equipment as indicated on the Drawings.

F. Perform work and provide material and equipment as shown on Drawings and as specified or indicated in this Section of the Specifications. Completely coordinate work of this Section with work of other trades and provide a complete and fully functional installation.

G. Give notices, file plans, obtain permits and licenses, pay fees and back charges, and obtain necessary approvals from authorities that have jurisdiction as required to perform work in accordance with all legal requirements and with Specifications, Drawings, Addenda and Change Orders, all of which are part of Contract Documents.

1.3 SUBMITTALS

A. Comply with requirements specified in Section 013300 – SUBMITTAL REQUIREMENTS.

B. Shop Drawing: Shop drawings shall include, but not be limited to, the following:
1. Generator exhaust flue material and exhaust gas calculation.
2. Complete ductwork shop drawings, construction details and duct construction standards.

C. Hanger Pull-Out Testing Submittals and Requirements: Hangers and supports will be tested for pull-out by the Independent Testing Agency designated by the Project Manager. Comply with the requirements of Section 014325 – TESTING AGENCY SERVICES and the following:
1. Trade Contractor’s Documentation Prior to Testing:
a. Submit manufacturer’s name and model number for each type of hanger and support proposed for use, and technical data including type, load capacity, test reports, methods for installation, and use limitations.
b. Submit a schedule for each type of hanger and support indicating where units for testing will be installed, including substrate, and materials to be supported.

c. Submit a letter from Trade Contractor indicating supports have been installed in accordance with manufacturer's recommendations and project requirements, and are ready for testing.

2. Independent Testing Agency's Documentation Prior to Testing for Trade Contractor's Information:
   a. Submit the methods and type of equipment which will be used to test hangers and supports.
   b. Submit loads which will be applied, and criteria for acceptance or failure of hangers and supports.
3. Quantity to Be Installed by Trade Contractor for Testing: Two of each size of each type of hanger or support.
4. Testing Results: The Independent Testing Agency will submit reports indicating test results.
   a. Units which did not deform or fail during testing may remain in place.
   b. Units which failed during testing shall be replaced and testing repeated until satisfactory results are obtained.
   c. Cost of repeat testing will be at the expense of the Trade Contractor.
   d. Contractor shall repair damaged substrates, if any.

D. Delegated-Design Submittal: For each anchor and alignment guide, including analysis data, signed and sealed by the qualified professional engineer licensed in the Commonwealth of Massachusetts responsible for their preparation.
1. Design Calculations: Calculate requirements for thermal expansion of piping systems and for selecting and designing expansion joints, loops, and swing connections.
2. Anchor Details: Detail fabrication of each anchor indicated. Show dimensions and methods of assembly and attachment to building structure.
3. Alignment Guide Details: Detail field assembly and attachment to building structure.
4. Schedule: Indicate type, manufacturer's number, size, material, pressure rating, end connections, and location for each expansion joint.

1.4 DEFINITIONS

A. As used in this Section, "provide" means "furnish and install" and "HVAC" means "Heating, Ventilating and Air Conditioning" and "POS" means "Provided Under Other Sections". "Furnish" means "to purchase and deliver to the project site complete with every necessary appurtenance and support," and "Install" means "to unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project."

1.5 CONTRACT DOCUMENTS

A. Listing of Drawings does not limit responsibility of determining full extent of work required by Contract Documents. Refer to Architectural, HVAC, Electrical, Structural, and other Drawings and other Sections that indicate types of construction in which work shall be installed and work of other trades with which work of this Section must be coordinated.

B. Except where modified by a specific notation to the contrary, it shall be understood that the indication and/or description of any item, in the Drawings or specifications or both, carries with it the instruction to furnish and install the item, regardless of whether or not this instruction is explicitly stated as part of the indication or description.

C. Items referred to in singular number in Contract Documents shall be provided in quantities necessary to complete work.

D. Drawings are diagrammatic. They are not intended to be absolutely precise; they are not intended to specify or to show every offset, fitting, and component. The purpose of the Drawings is to indicate a systems concept, the main components of the systems, and the approximate geometrical relationships. Based on the systems concept, the main components, and the approximate geometrical relationships, the contractor shall provide all other components and materials necessary to make the systems fully complete and operational.

E. Information and components shown on riser diagrams but not shown on plans, and vice versa, shall apply or be provided as if expressly required on both.

F. Data that may be furnished electronically by the Designer (on computer tape, diskette, or otherwise) is diagrammatic. Such electronically furnished information is subject to the same limitation of precision as heretofore described. If furnished, such data is for convenience and generalized reference, and shall not substitute for Designer ’s sealed or stamped construction documents.

1.6 DISCREPANCIES IN DOCUMENTS

A. Where Drawings or Specifications conflict or are unclear, advise Designer in writing before Award of Contract. Otherwise, Designer’s interpretation of Contract Documents shall be final, and no additional compensation shall be permitted due to discrepancies or ambiguities thus resolved.

B. Where Drawings or Specifications do not coincide with manufacturers' recommendations, or with applicable codes and standards, alert Designer in writing before installation. Otherwise, make changes in installed work as Designer requires within Contract Price.

C. If the required material, installation, or work can be interpreted differently from drawing to drawing, or between drawings and specs, this contractor shall provide that material, installation, or work which is of the higher standard.

D. It is the intent of these contract documents to have the contractor provide systems and components that are fully complete and operational and fully suitable for the intended use. There may be situations in the documents where insufficient information exists to precisely describe a certain component or subsystem, or the routing of a component. In cases such as this, where the contractor has failed to notify the Designer of the situation in accordance with Paragraph (A) above, the contractor shall provide the specific component or subsystem with all parts necessary for the intended use, fully complete and operational, and installed in workmanlike manner either concealed or exposed per the design intent.

E. In cases covered by Paragraph (D) above, where the contractor believes he needs engineering guidance, he shall submit a sketch identifying his proposed solution and the Designer shall review, note if necessary, and approve the sketch.

1.7 MODIFICATIONS IN LAYOUT

A. HVAC, Plumbing, Fire Protection, and Electrical Drawings are diagrammatic. They indicate general arrangements of mechanical and electrical systems and other work. They do not show all offsets required for coordination nor do they show the exact routings and locations needed to coordinate with structure and other trades and to meet architectural requirements.

B. In all spaces, prior to installation of visible material and equipment, including access panels, review Architectural Drawings for exact locations and where not definitely indicated, request information from Designer.

C. Check Contract Drawings as well as Shop Drawings of all subcontractors to verify and coordinate spaces in which work of this Section will be installed.

D. Maintain maximum headroom at all locations. All piping, duct, conduit, and associated components to be as tight to underside of structure as possible.

E. Make reasonable modifications in layout and components needed to prevent conflict with work of other trades and to coordinate according to Paragraphs A, B, C, and D above. Systems shall be run in a rectilinear fashion.

F. Where conflicts or potential conflicts exist and engineering guidance is desired, submit sketch of proposed resolution to Designer for review and approval.

1.8 DELIVERY STORAGE AND HANDLING

A. Valves and fire hydrants:
   1. Shipping:
      a. Protect internal parts against rust and corrosion.
      b. Protect threads, flange faces, and weld ends.
      c. Set valves in best position for handling. Setting valves closed prevents rattling; Setting valves open minimizes exposure of functional surfaces.
   2. Storage:
      a. Maintain valve end protection.
      b. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
   3. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.
   4. Protect flanges and specialties from moisture and dirt.
   5. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.9 EXISTING CONDITIONS AND PREPARATORY WORK

A. Before starting work in a particular area of the project, visit site and examine conditions under which work must be performed including preparatory work done under other Sections or Contracts. Report conditions that might affect work adversely in writing through Contractor to Designer. Do not proceed with work until defects have been corrected and conditions are satisfactory. Commencement of work shall be construed as complete acceptance of existing conditions and preparatory work.

1.10 CODES, STANDARDS, AUTHORITIES AND PERMITS

A. Perform work strictly as required by rules, regulations, standards, codes, ordinances, and laws of local, state, and Federal governments, and other authorities that have legal jurisdiction over the site. Materials and equipment shall be manufactured, installed and tested as specified in latest editions of applicable publications, standards, rulings and determinations of:
   1. Local and state building, plumbing, mechanical, electrical, fire and health department codes.
   2. American Gas Association (AGA).
   3. National Fire Protection Association (NFPA).
   4. American Insurance Association (A.I.A.) (formerly National Board of Fire Underwriters).
   5. Occupational Safety and Health Act (OSHA).
   6. Underwriters' Laboratories (UL).

B. Material and equipment shall be listed by Underwriters' Laboratories (UL), and approved by ASME and AGA for intended service.

C. Most recent editions of applicable specifications and publications of the following organizations form part of Contract Documents:
   1. American National Standards Institute (ANSI).
   2. American Society of Mechanical Engineers (ASME).
   3. National Electric Manufacturers Association (NEMA).
   4. American Society for Testing and Materials (ASTM).
   5. American Water Works Association (AWWA).
   6. American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
   7. Air Moving and Conditioning Association (AMCA).
   8. Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
   9. American Diffuser Council (ADC).
   10. Air Conditioning and Refrigeration Institute (ARI).
   11. Thermal Insulation Manufacturers Association (TIMA).
   12. Institute of Electrical and Electronics Engineers (IEEE).
   13. Insulated Cable Engineers Association (ICEA).
   14. Certified Ballast Manufacturers (CMB).
   15. Illuminating Engineering Society (IES).

D. Special attention is directed to requirements of NFPA 45, Laboratories Using Chemicals.

1.11 GUARANTEE AND 24 HOUR SERVICE

A. Guarantee Work of this Section in writing for one year from the date of Certificate of Agency Use and Occupancy. Guarantees or warranties that start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable. If the equipment is used for ventilation, temporary heat, etc. prior to the date of Certificate of Agency Use and Occupancy, the bid price shall include an extended period of warranty covering the one year of occupancy, starting the date of Certificate of Agency Use and Occupancy. The guarantee shall repair or replace defective materials, equipment, workmanship and installation that develop within this period, promptly and to Designer ’s satisfaction and correct damage caused in making necessary repairs and replacements under guarantee within Contract Price.

B. In addition to guarantee requirements of Division 01 and of Subparagraph A above, obtain written equipment and material warranties offered in manufacturer's published data without exclusion or limitation, in DMH’s name.

C. Replace material and equipment that require excessive service during guarantee period as defined and as directed by Designer.

D. Provide 24 hour service beginning on the date the project is first occupied for public use by the User Agency, whether or not fully occupied, and lasting until the termination of the guarantee period. Service shall be at no cost to DMH. Service can be provided by this contractor or a separate service organization. Choice of service organization shall be subject to Designer and DMH approval. Submit name and a phone number that will be answered on a 24 hour basis each day of the week, for the duration of the service.

E. Submit copies of equipment and material warranties to Designer before final payment.

F. At end of guarantee period, transfer manufacturers' equipment and material warranties still in force to DMH.

G. This Paragraph shall not be interpreted to limit DMH’s rights under applicable codes and laws and under this Contract.

H. Part 2 Paragraphs of this Specification may specify warranty requirements that exceed those of this Paragraph.

I. Use of systems provided under this Section for temporary services and facilities shall not constitute Final Acceptance of work nor beneficial use, and shall not institute guarantee period.

J. Provide manufacturer's engineering and technical staff at site to analyze and rectify problems that develop during guarantee period immediately. If problems cannot be rectified immediately to The Owners Project Manager’s satisfaction, advise Designer in writing, describe efforts to rectify situation, and provide analysis of cause of problem. Designer will suggest course of action.

1.12 RECORD DRAWINGS

A. Comply with requirements specified in Section 017700 – CONTRACT CLOSEOUT.

B. All "main air" pneumatic control piping routing locations must be shown on the record Drawings.

C. Drawings shall show record condition of details, sections, riser diagrams, control changes and corrections to schedules. Schedules shall show actual manufacturer and make and model numbers of final equipment installation.

1.13 MANUALS, AND OPERATING INSTRUCTIONS, AND PROTECTION

A. Comply with requirements specified in Section 017700 – CONTRACT CLOSEOUT, including CAMIS spreadsheet data collection for Equipment Template and PM Procedure tabs.

B. Obtain at time of purchase of equipment, three copies of operation, lubrication and maintenance manuals for all items. Assemble literature in coordinated manuals with additional information describing combined operation of field assembled units, including as built wiring diagrams. Manual shall contain names and addresses of manufacturers and local representatives who stock or furnish repair parts for items or equipment. Divide manuals into three sections or books as follows:
   1. Directions for and sequence of operation of each item of HVAC system, e.g. air handling units and boilers. Sequence shall list valves, switches, and other devices used to start, stop and control system. Detail procedure to be followed in case of malfunctions. Include detailed approved flow diagrams of temperature control, heating, condensate, chilled water, condenser water, etc. as appropriate for systems provided. Include approved valve directory showing each valve number, location of each valve, and equipment or fixture controlled by valve.
   2. Detailed maintenance and troubleshooting manuals containing data furnished by manufacturer for complete maintenance. Include copy of balancing report.
   3. Lubrication instructions detailing type of lubricant, amount, and intervals recommended by manufacturer for each item of equipment. Include additional instructions necessary for implementation of first class lubrication program. Include approved summary of lubrication instructions in chart form, where appropriate.

C. Provide framed and glazed charts as follows: mount as directed by Designer.
   1. Flow diagrams from first part of manual as described above.
   2. Valve directory.
   3. Lubrication chart from third part of manual.

D. Upon completion of installation or when DMH accepts portions of building and equipment for operational use, instruct User Agency’s operating personnel in any or all parts of various systems. Instructions shall be performed by factory trained personnel. DMH shall determine which systems require additional instructions. Duration of instructions shall take equipment through complete cycle of operation (at least five working days). Make adjustments under operating conditions.

E. Each contractor shall be responsible for his work and equipment until finally inspected, tested, and accepted. Carefully store materials and equipment which are not immediately installed after delivery to site. Close open ends of work with temporary covers or plug during construction to prevent entry of obstructing material.

F. Each separate contractor shall protect the work and material of other trades that might be damaged by his work or workmen and make good all damage thus caused.

1.14 COORDINATION DRAWINGS

A. Refer to Section 013100 – PROJECT MANAGEMENT AND COORDINATION for coordination drawing requirements.

B. Coordination Drawings include but are not necessarily limited to:
1. Structure.
2. Partition/room layout.
3. Ceiling tile and grid.
4. Light fixtures.
5. Access panels.
6. Sheet metal, heating coils, boxes, grilles, diffusers, etc.
7. All HVAC heating piping and valves.
8. Duct insulation.
9. Smoke and fire dampers.
10. Soil, waste and vent piping.
11. Major water and medical gases.
12. Roof drain piping.
13. Major electrical conduit runs, panelboards, feeder conduit and racks of branch conduit.
14. Above ceiling miscellaneous metal.
15. Sprinkler piping and heads.
16. Heat tracing of piping.
17. Insulation.

1.15 BIM MODEL

A. Comply with requirements for the Heating, Ventilating and Air Conditioning Work in Section 013129 – BIM COORDINATION.

END OF SECTION

SECTION 23 05 00

BASIC HVAC REQUIREMENTS

(Part of Work of Section 23 00 01 – HVAC)

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements applicable to all Division 23 Sections. Also refer to Division 01 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 SCOPE OF WORK

A. This Specification and the associated drawings govern the furnishing, installing, testing and placing into satisfactory operation the Mechanical Systems.

B. Each Contractor shall provide all new materials indicated on the drawings and/or in these specifications, and all items required to make the portion of the Mechanical Work a finished and working system.

C. Separate contracts will be awarded for the following work:

D. All work will be awarded under a single General Contract. The division of work listed below is for the Contractor's convenience and lists normal breakdown of the work.

E. Separate contracts will be awarded for the following work. The division of work listed below is for the contractors' convenience and lists a normal breakdown of the work. Please refer to the Construction Manager's scope statements for complete scope of work description.

F. Scope of Work:

1. Heating Work shall include, but is not necessarily limited to:

    a. Furnish and install gas flues, stacks, and breechings.
    b. Furnish and install firestopping systems for penetrations of fire-rated construction associated with this Contractor's work.
    c. Complete all applicable tests, certifications, forms, and matrices.

2. Testing, Adjusting, and Balancing Work shall include, but is not necessarily limited to:

    a. Furnish complete testing, adjusting, and balancing as specified in Section 23 05 93, including, but not limited to, air systems, hydronic systems, plumbing systems, and verification of control systems.
    b. Complete all applicable tests, certifications, forms, and matrices

1.3 WORK SEQUENCE

A. All work that will produce excessive noise or interference with normal building operations, as determined by the Owner, shall be scheduled with the Owner. It may be necessary to schedule such work during unoccupied hours. The Owner reserves the right to determine when restricted construction hours will be required.

B. Itemize all work and list associated hours and pay scale for each item.

1.4 DIVISION OF WORK BETWEEN MECHANICAL, ELECTRICAL & CONTROL CONTRACTORS

A. Definitions:

1. "Mechanical Contractors" refers to the following:

    a. Heating Contractor.
    b. Air Conditioning and Ventilating Contractor.
    c. Temperature Control Contractor.
    d. Testing, Adjusting, and Balancing Contractor.

2. Motor Control Wiring: The wiring associated with the remote operation of the magnetic coils of magnetic motor starters or relays, or the wiring that permits direct cycling of motors by means of devices in series with the motor power wiring. In the latter case the devices are usually single phase and are usually connected to the motor power wiring through a manual motor starter having "Manual-Off-Auto" provisions.
3. Control devices such as start-stop push buttons, thermostats, pressure switches, flow switches, relays, etc., generally represent the types of equipment associated with motor control wiring.
4. Motor control wiring is single phase and usually 120 volts. In some instances, the voltage will be the same as the motor power wiring. Generally, where the motor power wiring exceeds 120 volts, a control transformer is used to give a control voltage of 120 volts.
5. Temperature Control Wiring: The wiring associated with the operation of a motorized damper, solenoid valve or motorized valve, etc., either modulating or two-position, as opposed to wiring which directly powers or controls a motor used to drive equipment such as fans, pumps, etc.

    a. This wiring will be from a 120 volt source and may continue as 120 volt, or be reduced in voltage (24 volt) in which case a control transformer shall be furnished as part of the temperature control wiring.

6. Control Motor: An electric device used to operate dampers, valves, etc. It may be two-position or modulating. Conventional characteristics of such a motor are 24 volts, 60 cycles, 1 phase, although other voltages may be encountered.
7. Voltage is generally specified and scheduled as distribution voltage. Motor submittals may be based on utilization voltage if it corresponds to the correct distribution voltage.

Distribution/Nominal Voltage	Utilization Voltage
120	115
208	200
240	230
277	265
480	460

B. General:

1. The purpose of these Specifications is to outline the Electrical and Mechanical Contractor's responsibilities related to electrical work required for items such as temperature controls, mechanical equipment, fans, chillers, compressors and the like. The exact wiring requirements for much of the equipment cannot be determined until the systems have been selected and submittals reviewed. Therefore, the electrical drawings show only known wiring related to such items. All wiring not shown on the electrical drawings, but required for mechanical systems, is the responsibility of the Mechanical Contractor.
2. Where the drawings require the Electrical Contractor to wire between equipment furnished by the Mechanical Contractor, such wiring shall terminate at terminals provided in the equipment. The Mechanical Contractor shall provide complete electrical power/controls wiring diagrams and supervision to the Electrical Contractor and designate the terminal numbers for correct wiring.
3. All electrical work shall conform to the National Electrical Code. All provisions of the Electrical Specifications concerning wiring, protection, etc., apply to wiring provided by the Mechanical Contractor unless noted otherwise.
4. Control low (24V) and control line (120V) voltage wiring, conduit, and related switches and relays required for the automatic control and/or interlock of motors and equipment, including final connection, are to be furnished and installed under Divisions 21, 22 and 23. Materials and installation to conform to Class 1 or 2 requirements.
5. All Contractors shall establish utility elevations prior to fabrication and shall coordinate their material and equipment with other trades. When a conflict arises, priority is as follows:

    a. Light fixtures.
    b. Gravity flow piping, including steam and condensate.
    c. Electrical busduct.
    d. Sheet metal.
    e. Electrical cable trays, including access space.
    f. Sprinkler piping and other piping.
    g. Electrical conduits and wireway.

C. Mechanical Contractor's Responsibility:

1. Assumes responsibility for internal wiring of all equipment provided by the Mechanical Contractor, for example:

    a. Computer Room Air Conditioning Units.
    b. Condensate Return Stations.
    c. Condensing Units.
    d. Makeup Air Units.
    e. Electric Humidifiers.
    f. Gas Trains.
    g. Package Air Handling Units.
    h. Packaged Rooftop Units.

2. Assumes all responsibility for the Temperature Control wiring, when the Temperature Control Contractor is a Subcontractor to the Mechanical Contractor.
3. Shall verify all existing equipment sizes and capacities where units are to be modified, moved or replaced. Contractor shall notify Architect/Engineer of any discrepancies prior to ordering new units or replacement parts, including replacements of equipment motors.
4. Temperature Control [**Subcontractor's**][**Contractor's**] Responsibility:

    a. Wiring of all devices needed to make the Temperature Control System functional.
    b. Verifying any control wiring on the electrical drawings as being by the Electrical Contractor. All wiring required for the Control System, but not shown on the electrical drawings, is the responsibility of the Temperature Control [**Subcontractor**][**Contractor**].
    c. Coordinating equipment locations (such as relays, transformers, etc.) with the Electrical Contractor, where wiring of the equipment is by the Electrical Contractor.

5. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

D. Electrical Contractor's Responsibility:

1. Provides all combination starters, manual starters and disconnect devices shown on the Electrical Drawings or indicated to be by the Electrical Contractor on the Mechanical Drawings or Specifications.
2. Installs and wires all remote control devices furnished by the Mechanical Contractor or Temperature Control subcontractor when so noted on the Electrical Drawings.
3. Provides motor control and temperature control wiring, where so noted on the drawings.
4. Coordinate with the Mechanical Contractor for size of motors and/or other electrical devices involved with repair or replacement of existing equipment.
5. Furnishes, installs and connects all relays, etc., for automatic shutdown of certain fans upon actuation of the Fire Alarm System as indicated and specified in Division 28.

6. This Contractor is responsible for coordination of utilities with all other Contractors. If any field coordination conflicts are found, the Contractor shall coordinate with other Contractors to determine a viable layout.

1.5 COORDINATION DRAWINGS

A. Definitions:

1. Coordination Drawings: A compilation of the pertinent layout and system drawings that show the sizes and locations, including elevations, of system components and required access areas to ensure that no two objects will occupy the same space.

    a. Mechanical trades shall include, but are not limited to, mechanical equipment, ductwork, fire protection systems, plumbing piping, medical gas systems, hydronic piping, steam and steam condensate piping, and any item that may impact coordination with other disciplines.
    b. Electrical trades shall include, but are not limited to, electrical equipment, conduit 1.5" (40 mm) and larger, conduit racks, cable trays, pull boxes, transformers, raceway, busway, lighting, ceiling-mounted devices, and any item that may impact coordination with other disciplines.
    c. Technology trades shall include, but are not limited to, technology equipment, racks, conduit 1.5" (40 mm) and larger, conduit racks, cable trays, ladder rack, pull boxes, raceway, ceiling-mounted devices, and any item that may impact coordination with other disciplines.
    d. Maintenance clearances and code-required dedicated space shall be included.
    e. The coordination drawings shall include all underground, underfloor, in-floor, in chase, and vertical trade items.

2. Spaces with open/cloud ceiling architecture shall indicate the overhead utilities and locate equipment as required to maintain clearance above lights. The intent for the installation is to maintain a maximum allowable vertical clearance and an organized/clean manner in the horizontal. Notify Architect/Engineer of the maximum clearance which can be maintained. Failure to comply will result in modifications with no cost to Owner.

    a. In cloud ceiling architecture, when open cabling/wire and/or cable tray crosses gaps between ceiling clouds and/or walls, cabling is to transition to conduits to span the gaps in order to conceal cabling from below.

3. The contractors shall use the coordination process to identify the proper sequence of installation of all utilities above ceilings and in other congested areas, to ensure an orderly and coordinated end result, and to provide adequate access for service and maintenance.

B. Participation:

1. The contractors and subcontractors responsible for work defined above shall participate in the coordination drawing process.

2. One contractor shall be designated as the Coordinating Contractor for purposes of preparing a complete set of composite electronic CAD coordination drawings that include all applicable trades, and for coordinating the activities related to this process. The Coordinating Contractor for this project shall be the [**Mechanical Contractor**].

    a. The Coordinating Contractor shall utilize personnel familiar with requirements of this project and skilled as draftspersons/CAD operators, competent to prepare the required coordination drawings.

3. Electronic CAD drawings shall be submitted to the Coordinating Contractor for addition of work by other trades. IMEG will provide electronic file copies of applicable drawings for contractor's use if the contractor signs and returns an "Electronic File Transfer" waiver provided by IMEG. IMEG will not consider blatant reproductions of original file copies an acceptable alternative for coordination drawings.

C. Drawing Requirements:

1. The file format and file naming convention shall be coordinated with and agreed to by all contractors participating in the coordination process and the Owner.

    a. Scale of drawings:

        1) General plans: 1/4 Inch = 1'-0" (minimum).
        2) Mechanical, electrical, communication rooms, and including the surrounding areas within 10 feet: 1/2 Inch = 1'-0" (minimum).
        3) Shafts and risers: 1/2 Inch = 1'-0" (minimum).
        4) Sections of shafts and mechanical and electrical equipment rooms: 1/4 Inch = 1'-0" (minimum).
        5) Sections of congested areas: 1/2 Inch = 1'-0" (minimum).

2. Ductwork layout drawings shall be the baseline system for other components. Ductwork layout drawings shall be modified to accommodate other components as the coordination process progresses.
3. There may be more drawings required for risers, top and bottom levels of mechanical rooms, and shafts.
4. The minimum quantity of drawings will be established at the first coordination meeting and sent to the Architect/Engineer for review. Additional drawings may be required if other areas of congestion are discovered during the coordination process.

D. General:

1. Coordination drawing files shall be made available to the Architect/Engineer and Owner's Representative. The Architect/Engineer will only review identified conflicts and give an opinion, but will not perform as a coordinator.
2. A plotted set of coordination drawings shall be available at the project site.
3. Coordination drawings are not shop drawings and shall not be submitted as such.

4. The contract drawings are schematic in nature and do not show every fitting and appurtenance for each utility. Each contractor is expected to have included in the bid sufficient fittings, material, and labor to allow for adjustments in routing of utilities made necessary by the coordination process and to provide a complete and functional system.
5. The contractors will not be allowed additional costs or time extensions due to participation in the coordination process.
6. The contractors will not be allowed additional costs or time extensions for additional fittings, reroutings or changes of duct size, that are essentially equivalent sizes to those shown on the drawings and determined necessary through the coordination process.
7. The Architect/Engineer reserves the right to determine space priority of equipment in the event of spatial conflicts or interference between equipment, piping, conduit, ducts, and equipment provided by the trades.
8. Changes to the contract documents that are necessary for systems installation and coordination shall be brought to the attention of the Architect/Engineer.
9. Access panels shall preferably occur only in gypsum board walls or plaster ceilings where indicated on the drawings.

    a. Access to mechanical, electrical, technology, and other items located above the ceiling shall be through accessible lay-in ceiling tile areas.
    b. Potential layout changes shall be made to avoid additional access panels.
    c. Additional access panels shall not be allowed without written approval from the Architect/Engineer at the coordination drawing stage.
    d. Providing additional access panels shall be considered after other alternatives are reviewed and discarded by the Architect/Engineer and the Owner's Representative.
    e. When additional access panels are required, they shall be provided without additional cost to the Owner.

10. Complete the coordination drawing process and obtain sign off of the drawings by all contractors prior to installing any of the components.
11. Conflicts that result after the coordination drawings are signed off shall be the responsibility of the contractor or subcontractor who did not properly identify their work requirements, or installed their work without proper coordination.
12. Updated coordination drawings that reflect as-built conditions may be used as record documents.

1.6 QUALITY ASSURANCE

A. Contractor's Responsibility Prior to Submitting Pricing Data:

1. The Contractor is responsible for constructing complete and operating systems. The Contractor acknowledges and understands that the Contract Documents are a two-dimensional representation of a three-dimensional object, subject to human interpretation. This representation may include imperfect data, interpreted codes, utility guidelines, three-dimensional conflicts, and required field coordination items. Such deficiencies can be corrected when identified prior to ordering material and starting installation. The Contractor agrees to carefully study and compare the individual Contract Documents and report at once in writing to the Design Team any deficiencies the Contractor may discover. The Contractor further agrees to require each subcontractor to likewise study the documents and report at once any deficiencies discovered.
2. The Contractor shall resolve all reported deficiencies with the Architect/Engineer prior to awarding any subcontracts, ordering material, or starting any work with the Contractor's own employees. Any work performed prior to receipt of instructions from the Design Team will be done at the Contractor's risk.

B. Qualifications:

1. All Contractors and subcontractors shall employ only workers skilled in their trades.

C. Compliance with Codes, Laws, Ordinances:

1. Conform to all requirements of the City of Fall River and the Commonwealth of Massachusetts Codes, Laws, Ordinances and other regulations having jurisdiction.
2. Conform to all State Codes.
3. If there is a discrepancy between the codes and regulations and these specifications, the Architect/Engineer shall determine the method or equipment used.
4. If the Contractor notes, at the time of bidding, that any parts of the drawings or specifications do not comply with the codes or regulations, Contractor shall inform the Architect/Engineer in writing, requesting a clarification. If there is insufficient time for this procedure, Contractor shall submit with the proposal a separate price to make the system comply with the codes and regulations.
5. All changes to the system made after letting of the contract, to comply with codes or requirements of Inspectors, shall be made by the Contractor without cost to the Owner.
6. If there is a discrepancy between manufacturer's recommendations and these specifications, the manufacturer's recommendations shall govern.
7. All rotating shafts and/or equipment shall be completely guarded from all contact. Partial guards and/or guards that do not meet all applicable OSHA standards are not acceptable. Contractor is responsible for providing this guarding if it is not provided with the equipment supplied.

D. Permits, Fees, Taxes, Inspections:

1. Procure all applicable permits and licenses.
2. Abide by all laws, regulations, ordinances, and other rules of the State or Political Subdivision where the work is done, or as required by any duly constituted public authority.
3. Pay all charges for permits or licenses.
4. Pay all fees and taxes imposed by the State, Municipal and/or other regulatory bodies.
5. Pay all charges arising out of required inspections by an authorized body.
6. Pay all charges arising out of required contract document reviews associated with the project and as initiated by the Owner or authorized agency/consultant.
7. Where applicable, all fixtures, equipment and materials shall be[listed by Underwriters' Laboratories, Inc. and approved by FM Global.][approved or listed by Underwriter's Laboratories, Inc.]

E. Utility Company Requirements:

1. Secure from the appropriate private or public utility company all applicable requirements.
2. Comply with all utility company requirements.
3. Make application for and pay for service connections, such as gas.
4. Make application for and pay for all meters and metering systems required by the utility company.

F. Examination of Drawings:

1. The drawings for the mechanical work are completely diagrammatic, intended to convey the scope of the work and to indicate the general arrangements and locations of equipment, outlets, etc., and the approximate sizes of equipment.
2. Contractor shall determine the exact locations of equipment and rough-ins, and the exact routing of pipes and ducts to best fit the layout of the job.
3. Scaling of the drawings is not sufficient or accurate for determining these locations.
4. Where job conditions require reasonable changes in indicated arrangements and locations, such changes shall be made by the Contractor at no additional cost to the Owner.
5. Because of the scale of the drawings, certain basic items, such as fittings, boxes, valves, unions, etc., may not be shown, but where required by other sections of the specifications or required for proper installation of the work, such items shall be furnished and installed.
6. If an item is either on the drawings or in the specifications, it shall be included in this contract.
7. Determination of quantities of material and equipment required shall be made by the Contractor from the documents. Where discrepancies arise between drawings, schedules and/or specifications, the greater number shall govern.
8. Where used in mechanical documents, the word "furnish" shall mean supply for use, the word "install" shall mean connect complete and ready for operation, and the word "provide" shall mean to supply for use and connect complete and ready for operation.

    a. Any item listed as furnished shall also be installed, unless otherwise noted.
    b. Any item listed as installed shall also be furnished, unless otherwise noted.

G. Field Measurements:

1. Verify all pertinent dimensions at the job site before ordering any materials or fabricating any supports, pipes or ducts.

H. Electronic Media/Files:

1. Construction drawings for this project have been prepared utilizing Revit.
2. Contractors and Subcontractors may request electronic media files of the contract drawings and/or copies of the specifications. Specifications will be provided in PDF format.
3. Folder. Upon request for electronic media, the Contractor shall complete and return a signed "Electronic File Transmittal" form provided by IMEG.
4. If the information requested includes floor plans prepared by others, the Contractor will be responsible for obtaining approval from the appropriate Design Professional for use of that part of the document.
5. The electronic contract documents can be used for preparation of shop drawings and as-built drawings only. The information may not be used in whole or in part for any other project.
6. The drawings prepared by IMEG for bidding purposes may not be used directly for ductwork layout drawings or coordination drawings.
7. The use of these CAD documents by the Contractor does not relieve them from their responsibility for coordination of work with other trades and verification of space available for the installation.
8. The information is provided to expedite the project and assist the Contractor with no guarantee by IMEG as to the accuracy or correctness of the information provided. IMEG accepts no responsibility or liability for the Contractor's use of these documents.

1.7 WEB-BASED PROJECT SOFTWARE

A. The General Contractor shall provide a web-based project software site for the purpose of hosting and managing project communication and documentation until completion of the warranty phase.

B. The web-based project software shall include, at a minimum, the following features: construction schedule, submittals, RFIs, ASIs, construction change directives, change orders, drawing management, specification management, payment applications, contract modifications, meeting minutes, construction progress photos.

C. Provide web-based project software user licenses for use by the Architect/Engineer. Access will be provided from the start of the project through the completion of the warranty phase.

D. At project completion, provide digital archive of entire project in format that is readable by common desktop software applications in format acceptable to Architect/Engineer. Provide data in locked format to prevent further changes.

Referenced Specification Section	Submittal Item

23 05 05	HVAC Demolition For Remodeling
23 05 16	Expansion Compensation
23 05 29	Hangers and Supports
23 05 48	Vibration Isolation Equipment
23 05 53	HVAC Identification
23 05 93	Testing, Adjusting, and Balancing
23 51 00	Prefabricated Stacks

1.8 SCHEDULE OF VALUES

A. The requirements herein are in addition to the provisions of Division 01.

B. Format:

1. Use AIA Document Continuation Sheets G703 or another similar form approved by the Owner and Architect/Engineer.
2. Submit in Excel format.
3. Support values given with substantiating data.

C. Preparation:

1. Itemize work required by each specification section and list all providers. All work provided by subcontractors and major suppliers shall be listed on the Schedule of Values. List each subcontractor and supplier by company name.
2. Break down all costs into:

    a. Material: Delivered cost of product with taxes paid.
    b. Labor: Labor cost, excluding overhead and profit.

3. Itemize the cost for each of the following:

    a. Overhead and profit.
    b. Bonds.
    c. Insurance.
    d. General Requirements: Itemize all requirements.

4. For each line item having an installed cost of more than $5,000, break down costs to list major products or operations under each item. At a minimum, provide material and labor cost line items for the following:

    a. Each piece of equipment requiring shop drawings (e.g., each air handling unit, pump, exhaust fan, etc.). Use the equipment nomenclature (AHU-1, P-1, EF-1, etc.) on the Schedule of Values.
    b. Each type of small unitary equipment (e.g., FCUs, UHs, CABs, etc.). Multiple units of the same type can be listed together, provided quantities are also listed so unit costs can be determined.

c. Each piping system (chilled water, heating water, steam, condensate, etc.). In addition, for larger projects, break down the material and labor for each piping system based on geography (building, floor, and/or wing).
d. Each duct system (supply, return, relief, outside air, etc.) listed separately for each unit they serve (AHU-1 supply air ductwork, AHU-1 return air ductwork, etc.).
e. Pipe insulation with separate material and labor line items for each piping system listed above.
f. Duct insulation with separate material and labor line items for each duct system listed above.
g. Temperature controls broken down into material and labor for the following:

1) Engineering
2) Controllers, devices, sensors, etc.
3) Control valves
4) Control dampers
5) Conduit
6) Wiring
7) Programming
8) Commissioning

h. Site utilities (5' beyond building)
i. Seismic design
j. Air balancing
k. Water balancing
l. Commissioning
m. Record drawings
n. Punchlist and closeout

D. Update Schedule of Values when:

1. Indicated by Architect/Engineer.
2. Change of subcontractor or supplier occurs.
3. Change of product or equipment occurs.

1.9 CHANGE ORDERS

A. A detailed material and labor takeoff shall be prepared for each change order, along with labor rates and markup percentages. Change orders shall be broken down by sheet or associated individual line item indicated in the change associated narrative, whichever provides the most detailed breakdown. Change orders with inadequate breakdown will be rejected.

B. Itemized pricing with unit cost shall be provided from all distributors and associated subcontractors.

C. Change order work shall not proceed until authorized.

1.10 EQUIPMENT SUPPLIERS' INSPECTION

A. The following equipment shall not be placed in operation until a competent installation and service representative of the manufacturer has inspected the installation and certified that the equipment is properly installed, adjusted and lubricated; that preliminary operating instructions have been given; and that the equipment is ready for operation:

1. Air Cooled Condensers
2. Base Mounted Pumps
3. Boilers, Burners and Boiler Trim
4. Computer Room Units
5. Condensing Units
6. Cooling Towers
7. Gas Fired Makeup Air Units
8. Fire Seal Systems
9. Fluid Coolers
10. Seismic Restraints and Equipment Bracing
11. Water Chillers

B. Contractor shall arrange for and obtain supplier's on-site inspection(s) at proper time(s) to assure each phase of equipment installation and/or connection is in accordance with the manufacturer's instructions.

C. Submit copies of start-up reports to the Architect/Engineer and include copies of Owner's Operation and Maintenance Manuals.

1.11 PRODUCT DELIVERY, STORAGE, HANDLING & MAINTENANCE

A. Exercise care in transporting and handling to avoid damage to materials. Store materials on the site to prevent damage. Keep materials clean, dry and free from harmful conditions. Immediately remove any materials that become wet or that are suspected of becoming contaminated with mold or other organisms.

B. Keep all bearings properly lubricated and all belts properly tensioned and aligned.

C. Coordinate the installation of heavy and large equipment with the General Contractor and/or Owner. If the Mechanical Contractor does not have prior documented experience in rigging and lifting similar equipment, he/she shall contract with a qualified lifting and rigging service that has similar documented experience. Follow all equipment lifting and support guidelines for handling and moving.

D. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate the work with other trades.

1.12 NETWORK / INTERNET CONNECTED EQUIPMENT

A. These specifications may require certain equipment or systems to have network, Internet and/or remote access capability ("Network Capability"). Any requirement for Network Capability shall be interpreted only as a functional capability and is not to be construed as authority to connect or enable any Network Capability. Network Capability may only be connected or enabled with the express written consent of the Owner.

1.13 WARRANTY

A. Provide one-year warranty, unless otherwise noted, to the Owner for all fixtures, equipment, materials, and workmanship.

B. The warranty period for all work in this Division of the specifications shall commence on the date of final acceptance, unless a whole or partial system or any separate piece of equipment or component is put into use for the benefit of any party other than the installing contractor with prior written authorization. In this instance, the warranty period shall commence on the date when such whole system, partial system or separate piece of equipment or component is placed in operation and accepted in writing by the Owner.

C. Warranty requirements shall extend to correction, without cost to the Owner, of all Work found to be defective or nonconforming to the contract documents. The Contractor shall bear the cost of correcting all damage resulting from defects or nonconformance with contract documents.

1.14 INSURANCE

A. Contractor shall maintain insurance coverage as set forth in Division 0 of these specifications.

1.15 MATERIAL SUBSTITUTION

A. Where several manufacturers' names are given, the scheduled manufacturer is the basis for job design and establishes the quality required.

B. Equivalent equipment manufactured by the other listed manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications and fits in the allocated space. When using other listed manufacturers, the Contractor shall assume responsibility for any and all modifications necessary (including, but not limited to structural supports, electrical connections, piping and ductwork connections and arrangement, plumbing connections and rough-in, and regulatory agency approval, etc.) and coordinate such with other contractors.

C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer not later than ten days prior to the bid opening.

D. This Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on the Contractors part or on the part of other Contractors whose work is affected.

E. This Contractor may list voluntary add or deduct prices for alternate materials on the bid form. These items will not be used in determining the low bidder.

F. All material substitutions requested later than ten (10) days prior to bid opening must be listed as voluntary changes on the bid form.

1.16 PROJECT COMMISSIONING

A. The Contractor shall work with the Commissioning Agent (CxA) as described in Section [**01 91 00][and**][**23 08 00**] and provide all services as described in the Commissioning Plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or the employees and subconsultants at a construction site, shall relieve the Contractor and other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy.

3.2 EXCAVATION, FILL, BACKFILL, COMPACTION

A. General:

1. Prior to the commencement of any excavation or digging, the Contractor shall verify all underground utilities with the regional utility locator. Provide prior notice to the locator before excavations. Contact information for most regional utility locaters can be found at the following website (https://call811.com/) or by calling 811.
2. The Contractor shall do all excavating, filling, backfilling and compacting associated with the work.

B. Excavation:

1. Make all excavations to accurate, solid, undisturbed earth, and to proper dimensions.

2. Where excavations are made in error below foundations, concrete of same strength as specified for the foundations or thoroughly compacted sand-gravel fill, as determined by the Architect/Engineer, shall be placed in such excess excavations. Place thoroughly compacted, clean, stable fill in excess excavations under slabs on grade, at the Contractor's expense.
3. Trim bottom and sides of excavations to grades required for foundations.
4. Protect excavations against frost and freezing.
5. Take care in excavating not to damage surrounding structures, equipment, or buried pipe. Do not undermine footing or foundation.
6. Perform all trenching in a manner to prevent cave-ins and risk to workers.
7. Where original surface is pavement or concrete, the surface shall be saw cut to provide clean edges and assist in the surface restoration.
8. Where satisfactory bearing soil for foundations is not found at the indicated levels, the Architect/Engineer or their representative shall be notified immediately, and no further work shall be done until further instructions are given by the Architect/Engineer or their representative.

C. Dewatering:

1. Contractor shall furnish, install, operate, and remove all dewatering pumps and pipes needed to keep trenches and pits free of water.

D. Underground Obstructions:

1. Known underground piping, foundations, and other obstructions in the vicinity of construction are shown on the drawings. Use great care in making installations near underground obstruction.
2. If objects not shown on the drawings are encountered, remove, relocate, or perform extra work as directed by the Architect/Engineer.

E. Fill and Backfilling:

1. Utilities Bedding: Lay underground utilities on minimum of 6"sand bedding. Compact bedding under utilities smooth, with no sharp edges protruding, to protect the utilities from puncture. Shape bedding to provide continuous support for bells, joints, and barrels of utilities and for joints and fittings.
2. Envelope Around Utilities to 6" Above Utilities: Place sand to a height of 6" over utilities in 6" layers. After connection joints are made, any misalignment can be corrected by tamping backfill around the utilities.
3. Backfill From 6" Above Utilities to Earthen Grade: Place all backfill materials above the utilities in uniform layers not exceeding 6" deep.
4. Backfill From 6" Above Utilities to Below Slabs or Paved Area: Where the sand fill and backfill will ultimately be under a building, floor or paving, each layer of backfill materials shall be compacted to 95% of the maximum density determined by AASHTO Designation T 99 or ASTM Designation D 698. Moisture content of soil at time of compaction shall not exceed plus or minus 2% of optimum moisture content determined by AASHTO T 99 or ASTM D 698 test.
5. Backfill Materials:

a. Sand, CA6: Each layer shall be placed, then carefully and uniformly tamped, to eliminate lateral or vertical displacement.
b. Native Soil: Native soil materials may be used as backfill if approved by the Geotechnical Engineer. Native soils shall be free of rock or gravel larger than 3" in any dimension and shall be free of debris, waste, frozen materials, vegetation, high void content, and other deleterious materials. Each layer shall be placed, then carefully and uniformly tamped, to eliminate lateral or vertical displacement.
c. Flowable Fill: Cementitious, self-leveling, self-compacting slurry as defined by the ACI with compressive strength of 50-100psi at 28 days; consisting of a mixture of fine aggregate or filler, water and cementitious materials. Filler material consist of sand, fly ash, spent foundry sand, quarry fines, baghouse dust. Cementitious materials consist of Portland cement, pozzolanic materials, and self-cementing materials. Flowable fill may be placed in a pour instead of 6" layers noted above.

6. Water shall not be permitted to rise in unbackfilled trenches.
7. Dispose of excess excavated earth as directed.
8. Backfill all trenches and excavations immediately after installing utilities or removal of forms, unless other protection is provided.
9. Around piers and isolated foundations and structures, backfill and fill shall be placed and consolidated simultaneously on all sides to prevent wedge action and displacement. Fill and backfill materials shall be spread in 6 inch uniform horizontal layers with each layer compacted separately to required density.

F. Surface Restoration:

1. Where trenches are cut through existing graded, planted, or landscaped areas, the areas shall be restored to the original condition. Replace all planting removed or damaged to its original condition. A minimum of 6 inches of topsoil shall be applied where disturbed areas are to be seeded or sodded.
2. Concrete or asphalt type pavement, seal coat, rock, gravel or earth surfaces removed or damaged shall be replaced with comparable materials and restored to original condition.

3.3 ARCHITECT/ENGINEER OBSERVATION OF WORK

A. The Contractor shall provide seven (7) calendar days' notice to the Architect/Engineer prior to:

1. Placing fill over underground and underslab utilities.
2. Covering exterior walls, interior partitions and chases.
3. Installing hard or suspended ceilings and soffits.

B. The Architect/Engineer will have the opportunity to review the installation and provide a written report noting deficiencies requiring correction. The Contractor's schedule shall account for these reviews and show them as line items in the approved schedule.

C. Above-Ceiling Final Observation

1. All work above the ceilings must be complete prior to the Architect/Engineer's review. This includes, but is not limited to:

a. Pipe insulation is installed and fully sealed.
b. Pipe and duct wall penetrations are sealed.
c. Pipe identification and valve tags are installed.
d. Main, branch and flexible ducts are installed.
e. Diffusers, registers and grilles are installed and connected to ductwork.
f. Terminal air box reheat coil piping or wiring is complete.
g. Terminal air box control wiring is complete and all control boxes are closed.

2. In order to prevent the Above-Ceiling Final Observation from occurring too early, the Contractor shall review the status of the work and certify, in writing, that the work is ready for the Above-Ceiling Final Observation.
3. It is understood that if the Architect/Engineer finds the ceilings have been installed prior to this review and prior to 7 days elapsing, the Architect/Engineer may not recommend further payments to the contractor until such time as full access has been provided.

3.4 INSTRUCTING THE OWNER'S REPRESENTATIVES

A. Adequately instruct the Owner's designated representatives in the maintenance, care, and operation of all systems installed under this contract.

B. Provide verbal and written instructions to the Owner's representatives by FACTORY PERSONNEL in the care, maintenance, and operation of the equipment and systems.

C. Contractor shall make a DVD video recording of instructions to the Owner while explaining the system so additional personnel may view the instructions at a later date. The video recording shall be the property of the Owner.

D. The instructions shall include:

1. Explanation of all system flow diagrams.
2. Explanation of all air handling systems.
3. Temperature control system operation including calibration, adjustment and proper operating conditions of all sensors.
4. Maintenance of equipment.
5. Smoke control systems.
6. Stairwell pressurization systems.
7. Start-up procedures for all major equipment.
8. Explanation of seasonal system changes.
9. Description of emergency system operation.

E. Notify the Architect/Engineer of the time and place for the verbal instructions to be given to the Owner's representative so a representative can attend if desired.

F. Minimum hours of instruction for each item shall be:

1. Exhaust System(s) – 4 hours.

G. The Contractor shall prepare a detailed, written training agenda and submit it to the Architect/Engineer a minimum of two weeks prior to the formal training for approval. The written agenda shall include specific training points within the items described above. For example: how to adjust setpoints, troubleshooting, proper start-up, proper shut-down, seasonal changes, draining, venting, changing filters, changing belts, etc. Failure to provide and follow an approved training agenda may result in additional training required at the expense of the Contractor.

H. Operating Instructions:

1. Contractor is responsible for all instructions to the Owner's representatives for the mechanical and control systems.
2. If the Contractor does not have staff that can adequately provide the required instructions the Contractor shall include in the bid an adequate amount to reimburse the Owner for the Architect/Engineer to perform these services.

3.5 SYSTEM STARTING AND ADJUSTING

A. The mechanical systems shall be complete and operating. System startup, testing, adjusting, and balancing to obtain satisfactory system performance is the responsibility of the Contractor. This includes calibration and adjustments of all controls, noise level adjustments and final comfort adjustments as required.

B. Complete all manufacturer-recommended startup procedures and checklists to verify proper motor rotation, electrical power voltage is within equipment limitations, equipment controls maintain pressures and temperatures within acceptable ranges, all filters and protective guards are in-place, acceptable access is provided for maintenance and servicing, and equipment operation does not pose a danger to personnel or property.

C. Operate all HVAC systems continuously for at least one week prior to occupancy to bring construction materials to suitable moisture levels.

D. Contractor shall adjust the mechanical systems and controls at season changes during the one year warranty period, as required, to provide satisfactory operation and to prove performance of all systems in all seasons.

E. All operating conditions and control sequences shall be tested during the start-up period. Test all interlocks, safety shutdowns, controls, and alarms.

F. The Contractor, subcontractors, and equipment suppliers shall have skilled technicians to ensure that all systems perform properly. If the Architect/Engineer is requested to visit the job site for trouble shooting, assisting in start-up, obtaining satisfactory equipment operation, resolving installation and/or workmanship problems, equipment substitution issues or unsatisfactory system performance, including call backs during the warranty period, through no fault of the design; the Contractor shall reimburse the Owner on a time and materials basis for services rendered at the Architect/Engineer's standard hourly rates in effect when the services are requested. The Contractor shall pay the Owner for services required that are product, installation or workmanship related. Payment is due within 30 days after services are rendered.

3.6 RECORD DOCUMENTS

A. The following paragraphs supplement Division 01 requirements.

B. Maintain at the job site a separate and complete set of mechanical drawings and specifications with all changes made to the systems clearly and permanently marked in complete detail.

C. Mark drawings to indicate revisions to piping and ductwork, size and location, both exterior and interior; including locations of coils, dampers, other control devices, filters, and other units requiring periodic maintenance or repair; actual equipment locations, dimensioned from column lines; actual inverts and locations of underground piping; concealed equipment, dimensioned from column lines; mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (e.g., traps, strainers, expansion compensators, tanks, etc.); Change Orders; concealed control system devices.

D. Refer to Section 23 09 00 for additional requirements for Temperature Control documents.

E. Before completion of the project, a set of reproducible mechanical drawings will be given to the Contractor for transfer of all as-built conditions from the paper set maintained at the job site. All marks on reproducibles shall be clear and permanent.

F. Mark specifications to show approved substitutions; Change Orders, and actual equipment and materials used.

G. Record changes daily and keep the marked drawings available for the Architect/Engineer's examination at any normal work time.

H. Upon completing the job, and before final payment is made, give the marked-up drawings to the Architect/Engineer.

3.7 PAINTING

A. Paint all equipment that is marred or damaged prior to the Owner's acceptance. Paint and color shall match original equipment paint and shall be obtained from the equipment supplier if available.

B. Equipment in finished areas that will be painted to match the room decor will be painted by others. Should this Contractor install equipment in a finished area after the area has been painted, the Contractor shall have the equipment and all its supports, hangers, etc., painted to match the room decor.

C. Equipment cabinets, casings, covers, metal jackets, etc., in equipment rooms or concealed spaces, shall be furnished in standard or prime finish, free from scratches, abrasions, chips, etc.

D. Equipment in occupied spaces, or if standard to the unit, shall have a baked primer with baked enamel finish coat free from scratches, abrasions, chips, etc. If color option is specified or is standard to the unit, this Contractor shall, before ordering, verify with the Architect/Engineer the color preference and furnish this color.

E. Paint all equipment in unfinished areas such as boiler room, mechanical spaces, storage room, etc., furnished by this Contractor. Equipment furnished with a factory coat of paint and enamel need not be painted, provided the factory applied finish is not marred or spattered. If so, equipment shall be refinished with the same paint as was factory applied.

F. Paint all outdoor uninsulated steel piping the color selected by Owner or Architect/Engineer.

G. Paint all outdoor exposed natural gas piping the color selected by Owner or Architect/Engineer.

H. After surfaces have been thoroughly cleaned and are free of oil, dirt, and other foreign matter; paint all pipes and equipment with the following:

1. Bare Metal Surfaces - Apply one coat of primer suitable for the metal being painted. Finish with two coats of Alkyd base enamel paint.
2. Insulated Surfaces - Paint insulation jackets with two coats of semi-gloss acrylic latex paint.
3. Color of paint shall be as follows:

    a. All piping in mechanical room:

        1) Chilled Water: Blue pipe/black letters
        2) Condenser Water: Green pipe/black letters
        3) Heating Water: Orange pipe/black letters
        4) Natural Gas: Yellow pipe/black letters

    b. Piping exposed in kitchen:

        1) All Piping: White

3.8 ADJUST AND CLEAN

A. Thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project. Clean all foreign paint, grease, oil, dirt, labels, stickers, and other foreign material from all equipment.

B. Clean all drain pans and areas where moisture is present. Immediately report any mold, biological growth, or water damage.

C. Remove all rust, scale, dirt, oils, stickers and thoroughly clean exterior of all exposed bare metal ductwork, piping, hangers, and accessories.

D. Remove all rubbish, debris, etc., accumulated during construction from the premises.

3.9 SPECIAL REQUIREMENTS

A. Contractor shall coordinate the installation of all equipment, valves, dampers, operators, etc., with other trades to maintain clear access area for servicing.

B. All equipment shall be installed in such a way to maximize access to parts needing service or maintenance. Review the final field location, placement, and orientation of equipment with the Owner's designated representative prior to setting equipment.

C. Installation of equipment or devices without regard to coordination of access requirements and confirmation with the Owner's designated representative will result in removal and reinstallation of the equipment at the Contractor's expense.

3.10 IAQ MAINTENANCE FOR OCCUPIED FACILITIES UNDER CONSTRUCTION

A. Contractors shall make all reasonable efforts to prevent construction activities from affecting the air quality of the occupied areas of the building or outdoor areas near the building. These measures shall include, but not be limited to:

1. All contractors shall endeavor to minimize the amount of contaminants generated during construction. Methods to be employed shall include, but not be limited to:

    a. Minimizing the amount of dust generated.
    b. Reducing solvent fumes and VOC emissions.
    c. Maintain good housekeeping practices, including sweeping and periodic dust and debris removal. There should be no visible haze in the air.
    d. Protect stored on-site and installed absorptive materials from moisture damage.

2. Request that the Owner designate an IAQ representative.
3. Review and receive approval from the Owner's IAQ representative for all IAQ-related construction activities and negative pressure containment plans.
4. Inform the IAQ representative of all conditions that could adversely impact IAQ, including operations that will produce higher than normal dust production or odors.
5. Schedule activities that may cause IAQ conditions that are not acceptable to the Owner's IAQ representative during unoccupied periods.
6. Request copies of and follow all of the Owner's IAQ and infection control policies.
7. Unless no other access is possible, the entrance to construction site shall not be through the existing facility.
8. To minimize growth of infectious organisms, do not permit damp areas in or near the construction area to remain for over 24 hours.
9. In addition to the criteria above, provide measures as recommended in the SMACNA "IAQ Guidelines for Occupied Buildings Under Construction".
10. If permanently installed air handlers are used to serve both construction and occupied areas, all return grilles throughout construction areas shall be sealed to prevent air from construction areas being supplied to occupied areas.

11. If permanently installed air handlers are used during construction to serve only construction areas and do not supply air to adjacent occupied areas, MERV 8 filtration media shall be used to protect each return air grille or opening. The intent of this will be to prevent construction dust and debris from entering any return or supply air ductwork in the facility. All filtration media shall be replaced immediately prior to occupancy.
12. Construction areas shall be maintained at a negative pressure at all times during construction. When areas are under construction, HEPA filtered exhaust fan(s) shall be installed in sufficient quantities as required to maintain construction areas at sufficient negative pressure as called for in the Owner's Infection Control Risk Assessment (ICRA). HEPA filtered exhaust fan discharge shall be ducted either outdoors or back into designated hospital areas as called for in the Owner's ICRA.
13. For each area under construction, the Contractor shall install a negative pressure indicator equivalent to Lamiflow Model L-102F as manufactured by Lamiflow Technologies. Contractor shall regularly monitor and record the negative pressure condition of the construction areas as called for in the Owner's ICRA.

3.11 MAINTAINING CLEAN DUCTWORK THROUGHOUT CONSTRUCTION

A. Throughout the duration of construction, all ductwork shall be capped or sealed with sheet metal caps, polyethylene film, or other airtight protective to keep dust, dirt, and construction debris out of ducts. Similar means shall be used to seal air-side connections of HVAC equipment to include, but not limited to, air handling units, fans, terminal air boxes, fan coil units, cabinet heaters, blower coils, and the like.

B. When air terminal devices are installed, contractors shall seal all supply, return, and exhaust grilles with polyethylene film or other airtight protective to keep dust, dirt, and construction debris out of ducts.

C. Should HVAC equipment be started during construction, Contractor shall remove airtight protectives and shall install one-inch thick MERV 8 filter media over all return and exhaust grilles to prevent dust, dirt, and construction debris from entering ductwork. Filter media shall cover the entire grille face and shall be secured such that air cannot bypass filter media.

D. Should filter media become laden with dust and dirt, Contractor shall replace filter media with new media to prevent damage to air distribution system and equipment.

E. The following steps shall be taken during testing, adjusting, and balancing of each air system:

1. All construction activities in all spaces served by the air system shall stop.
2. All airtight protectives and temporary filter media shall be removed from all portions of the air system.
3. Testing, adjusting, and balancing work shall not commence until all construction activity is stopped and all airtight protectives and temporary filter media is removed.
4. Once testing, adjusting, and balancing work is complete for the air system, airtight protectives or temporary filter media shall be installed over all ductwork openings and air terminals on the air system prior to resuming construction activities in any spaces served by the air system.

F. The Owner shall agree the building is sufficiently clean prior to the removal of any filtration media and airtight protectives from air terminal devices.

3.12 UTILITY REBATE

A. Submit utility rebate forms, where offered at project location, with rebate items completed. Rebate may include lighting, lighting controls, variable speed drives, heat pumps, package terminal A/C, air conditioners, chillers, water heaters, programmable thermostats, and motors.

B. Contractor must submit notification of any value engineering or product substitution that will affect the utility rebate amount prior to approval.

READINESS CERTIFICATION PRIOR TO FINAL JOBSITE OBSERVATION

To prevent the final job observation from occurring too early, we require that the Contractor review the completion status of the project and, by copy of this document, certify that the job is indeed ready for the final job observation. The following is a typical list of items that represent the degree of job completeness expected prior to your requesting a final job observation.
1. Penetrations fire sealed and labeled in accordance with specifications.
2. All miscellaneous mechanical systems (unit heaters, fan coil units, cabinet heaters, etc.) operating.
2. Pipe insulation complete, pipes labeled, and valves tagged.

Accepted by:

Prime Contractor _____

By _____ Date _____

Upon Contractor certification that the project is complete and ready for a final job observation, we require the Contractor to sign this agreement and return it to the Architect/Engineer so that the final observation can be scheduled.

It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineers for additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

END OF SECTION

SECTION 23 05 05

HVAC DEMOLITION FOR REMODELING

(Part of Work of Section 23 00 01 – HVAC)

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Mechanical demolition.

B. Cutting and Patching.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF WORK AND DO NOT SHOW EVERY PIPE, DUCT, OR PIECE OF EQUIPMENT THAT MUST BE REMOVED. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY CONDITIONS PRIOR TO SUBMITTING A BID.

B. Where walls, ceilings, etc., are shown as being removed on general drawings, the Contractor shall remove all mechanical equipment, devices, fixtures, piping, ducts, systems, etc., from the removed area.

C. Where ceilings, walls, partitions, etc., are temporarily removed and replaced by others, This Contractor shall remove, store, and replace equipment, devices, fixtures, pipes, ducts, systems, etc.

D. Verify that abandoned utilities serve only abandoned equipment or facilities. Extend services to facilities or equipment that shall remain in operation following demolition.

E. Coordinate work with all other Contractors and the Owner. Schedule removal of equipment to avoid conflicts.

F. This Contractor shall verify all existing equipment sizes and capacities where equipment is scheduled to be replaced or modified, prior to ordering new equipment.

G. Bid submittal shall mean the Contractor has visited the project site and verified existing conditions and scope of work.

3.2 PREPARATION

A. Disconnect mechanical systems in walls, floors, and ceilings scheduled for removal.

B. Provide temporary connections to maintain existing systems in service during construction. When work must be performed on operating equipment, use personnel experienced in such operations.

C. Existing Heating System: Maintain existing system in service until new system is complete and ready for service. Drain system only to make switchovers and connections. Obtain permission from the Owner at least 48 hours before partially or completely draining system. Minimize outage duration.

3.3 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

A. Demolish and extend existing mechanical work under provisions of Division 2 and this Section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned ducts and piping to source of supply and/or main lines.

D. Remove exposed abandoned pipes and ducts, including abandoned pipes and ducts above accessible ceilings. Cut ducts flush with walls and floors, cap duct that remains, and patch surfaces. Cut pipes above ceilings, below floors and behind walls. Cap remaining lines. Repair building construction to match original. Remove all clamps, hangers, supports, etc. associated with pipe and duct removal.

E. Disconnect and remove mechanical devices and equipment serving equipment that has been removed.

F. Repair adjacent construction and finishes damaged during demolition and extension work.

G. Maintain access to existing mechanical installations which remain. Modify installation or provide access panels as appropriate.

H. Remove unused sections of supply and return air ductwork back to mains. Patch opening with sheet metal and seal airtight. Patch existing insulation to match existing. Where existing ductwork is to be capped and reused, locate the end cap within 6" of the last branch. End caps shall be 3" pressure class and seal class "A".

I. Extend existing installations using materials and methods compatible with existing installations, or as specified.

J. Properly reclaim and dispose of all refrigerant in demolished equipment and as required for extension of existing equipment.

3.4 CUTTING AND PATCHING

A. This Contractor is responsible for all penetrations of existing construction required to complete the work of this project. Refer to Section 23 05 29 for additional requirements.

B. Penetrations in existing construction should be reviewed carefully prior to proceeding with any work.

C. Penetrations shall be neat and clean with smooth and/or finished edges. Core drill where possible for clean opening.

D. Repair existing construction as required after penetration is complete to restore to original condition. Use similar materials and match adjacent construction unless otherwise noted or agreed to by the Architect/Engineer prior to start of work.

E. Floor slab on grade is a structural slab. All penetrations shall be X-rayed prior to cutting and/or drilling to avoid rebar or utilities encased in floor construction. Provide rebar dowels to replace damaged rebar and pin existing slab with patched slab. Refer to discipline plans for additional information.

F. Floor slab is post-tensioned. All penetrations shall be X-rayed prior to cutting and/or drilling to avoid any tension cables or utilities encased in floor construction.

G. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

3.5 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Clean all systems adjacent to project which are affected by the dust and debris caused by this construction.

C. MECHANICAL ITEMS REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL DISPOSE OF MATERIAL THE OWNER DOES NOT WANT TO REUSE OR RETAIN FOR MAINTENANCE PURPOSES.

3.6 SPECIAL REQUIREMENTS

A. Install temporary filter media over outside air intakes which are within 100 feet of the limits of construction or as noted on the drawings. This Contractor shall complete any cleaning required for existing systems which are affected by construction dust and debris.

B. Review locations of all new penetrations in existing floor slabs or walls. Determine construction type and review for possible interferences. Bring all concerns to the attention of the Architect/Engineer before proceeding.

END OF SECTION

SECTION 23 05 16

HVAC EXPANSION COMPENSATION

(Part of Work of Section 23 00 01 – HVAC)

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Expansion Joints and Compensators.

B. Pipe Loops, Offsets, and Swing Joints.

1.2 REFERENCES

A. Conform to Standards of Expansion Joint Manufacturer's Association.

1.3 SUBMITTALS

A. Submit shop drawings under provisions of Section 23 05 00.

B. Expansion joint shop drawings shall include maximum motion.

1.4 DESIGN CRITERIA

A. Unless noted otherwise, base expansion calculations on 50°F installation temperature to 210°F for heating water and steam condensate, plus 30% safety factor. Contact Architect/Engineer for steam temperatures.

PART 2 - PRODUCTS

2.1 EXPANSION JOINTS

A. Type EJ-1:

1. Multiple plies of 300 series stainless steel bellows.
2. Rated for 150 psi working pressure at 250°F and 100 psi at 400°F.
3. Cycle life shall be at least 1,000 full range (compression and extension) cycles at rated stroke and 6,000 cycles at 1/2 rated stroke.
4. Axial motion shall be as scheduled on the drawings, but not less than 2" (compression plus extension).
5. Provide stainless steel inner liner for all steam expansion joints.
6. Provide removable metal insulation shroud around the bellows.

7. Joints 2" or smaller in copper piping systems shall have all copper, brass or bronze construction with stainless steel bellows and union ends or sweat ends with unions added.

    a. Manufacturers:

        1) American BOA Type KH
        2) Hyspan Type 8509
        3) Flexonics Model HB
        4) Metraflex Model HPMF
        5) Keflex Series 7QT

8. Joints 2" or smaller in ferrous piping systems shall have steel bodies with union ends or male threaded ends with unions added.

    a. Manufacturers:

        1) American BOA Type B
        2) Hyspan Type 8503
        3) Flexonics Model H
        4) Metraflex Model HP
        5) Keflex Series 7Q-MPT

9. Joints 2-1/2" or larger shall have 150 lb. forged steel flanges.

    a. Manufacturers:

        1) American BOA Model 3150FS or 3150FL
        2) Hyspan Model 1501
        3) RM Model X-Flex-150 Multiply
        4) Keflex Series 311-1215
        5) Metraflex Model MNLC

B. Type EJ-2:

1. Multiple plies of 300 series stainless steel bellows.
2. Rated for 300 psi working pressure at 800°F.
3. Cycle life shall be at least 1,000 full range (compression and extension) cycles at rated stroke and 6,000 cycles at 1/2 rated stroke.
4. Axial motion shall be as scheduled on the drawings, but not less than 2" (compression and extension).
5. Joints shall have 300 lb. flanges on each end.
6. Provide stainless steel inner liner.
7. Provide removable metal insulation shroud around the bellows.

    a. Manufacturers:

        1) American BOA Type FS3300
        2) Flexonics

3) RM Model X-Flex-300 Multiply
4) Hyspan Model 1501

C. Type EJ-3:

1. Offset hinged or gimbal mounted, self-equalizing expansion joints with stainless steel carriers.
2. Suitable for vacuum to 300 psig.

a. Manufacturers:

1) Barco Manufacturing
2) Metraflex Model MC

D. Type EJ-4:

1. Assembly consisting of two flexible connectors, two stainless steel flexible connectors, two 90° elbows, and a 180° return pipe. Unit shall be in the form of a pipe loop.
2. Connectors shall have corrugated stainless hose bodies with stainless steel braided casings.
3. Connectors shall be rated for 150 psi working pressure at 70°F and 100 psi at 800°F.
4. Sizes 2" and smaller shall have steel threaded connections.
5. Sizes 2-1/2" and larger shall have 150 lb. steel flanges.
6. Connectors shall be suitable for 1/2" permanent misalignment.

a. Manufacturer:

1) Metraflex Type ML

E. Alignment Guides:

1. Bolted semi-steel spider.
2. Bolted guiding cylinder with supporting legs welded to pipe support.
3. Sized to allow insulation to pass through the outer cylinder.

a. Manufacturers:

1) American BOA
2) Hyspan
3) Flexonics
4) Keflex
5) Metraflex

F. Concrete Thrust Blocks - Rods and Clamps:

1. Bends, offsets, tees, crosses, and dead ends, including flange and spigot pieces, shall be suitably rodded or clamped and blocked with concrete thrust blocks.
2. Rods shall be all thread type, galvanized steel conforming to ANSI B1.1, Class 2A FIT, USS National Coarse Thread, tensile strength 55/77 ksi, yield strength 36 ksi minimum.
3. Rods and clamps shall receive one field coat of asphaltum after installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Accomplish structural work and provide equipment required to control expansion and contraction of piping; including loops, offsets, swing joints, and expansion joints where required.

B. Rigidly anchor pipe to building structure where necessary. Provide pipe guides so all movement occurs along axis of pipe only.

C. Each mechanical expansion joint shall have one anchor on each side and two alignment guides on each side of it. Guides shall be located within 4 and 14 pipe diameters of the mechanical expansion joint or as recommended by the joint manufacturer.

D. Preset all expansion joints to allow for expected expansion from installation temperature to operating temperature.

END OF SECTION

SECTION 23 05 29

HVAC SUPPORTS AND ANCHORS

(Part of Work of Section 23 00 01 – HVAC)

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Hangers, Supports, and Associated Anchors.

B. Sleeves and Seals.

C. Flashing and Sealing of Equipment and Pipe Stacks.

D. Cutting of Openings.

E. Escutcheon Plates and Trim.

1.2 REFERENCES

A. ANSI/ASME B31.1 - Power Piping.

B. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation.

C. MSS SP 69 - Pipe Hangers and Supports - Selection and Application.

D. MSS SP 89 - Pipe Hangers and Supports - Fabrication and Installation Practices.

E. MSS SP-127 - Bracing for Piping Systems Seismic-Wind-Dynamic Design, Selection, Application

1.3 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 23 05 00. Include plastic pipe manufacturers' support spacing requirements.

1.4 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish sleeves and hanger inserts to General Contractor for placement into formwork.

PART 2 - PRODUCTS

2.1 HANGER RODS

A. Hanger rods for single rod hangers shall conform to the following:

	Hanger Rod Diameter	
Pipe Size	Column #1	Column #2
2-1/2" and smaller	3/8"	3/8"
3" through 3-5/8"	3/8"	3/8"
4" and 5"	1/2"	1/2"
6"	3/4"	5/8"
8" through 12"	7/8"	3/4"
14"	1"	7/8"
16" and 18"	1"	N/A
20" and 24"	1-1/4"	N/A

Column #1: Steel pipe.
Column #2: Copper, plastic and fiberglass reinforced pipe.

B. Rods for double rod hangers may be reduced one size. Minimum rod diameter is 3/8 inches.

C. Hanger rods and accessories used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.

D. All hanger rods, nuts, washers, clevises, etc., in damp areas shall have ASTM A123 hot-dip galvanized finish applied after fabrication. This applies to the following areas:

2.2 PIPE AND STRUCTURAL SUPPORTS

A. General:

1. Pipe hangers, clamps, and supports shall conform to Manufacturers Standardization Society MSS SP-58, 69, 89, and 127 (where applicable).
2. On all insulated piping, provide at each support an insert of same thickness and contour as adjoining insulation, between the pipe and insulation jacket, to prevent insulation from sagging and crushing. Refer to insulation specifications for materials and additional information.

B. Vertical Supports:

1. Support and laterally brace vertical pipes at every floor level in multi-story structures, unless otherwise noted by applicable codes, but never at intervals over 15 feet. Support vertical pipes with riser clamps installed below hubs, couplings, or lugs. Provide sufficient flexibility to accommodate expansion and contraction to avoid compromising fire barrier penetrations or stressing piping at fixed takeoff locations.

    a. Products:

        1) Eaton Fig B3373 Series
        2) nVent 510 Series
        3) Anvil Fig. 90

2. Cold Pipe: Place restrained neoprene mounts beneath vertical pipe riser clamps to prevent sweating of cold pipes. Select neoprene mounts based on the weight of the pipe to be supported. Insulate over mounts.

    a. Products:

        1) Mason RBA, RCA or RDA
        2) Mason BR

3. Cold Pipe Alternative: Insulated pipe riser clamp with no thermal bridging between clamp and pipe; water repellant calcium silicate insulation material adhered inside the clamp; ASTM A653 galvanized steel clamp.

    a. Products:

        1) Pipeshields E100

4. Wall supports shall be used where vertical height of structure exceeds minimum spacing requirements. Install wall supports at same spacing as hangers or strut supports along vertical length of pipe runs. Wall supports shall be coordinated with the Structural Engineer.
5. Masonry Anchors: Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.

C. Hangers and Clamps:

1. Oversize all hangers, clamps, and supports on insulated piping to allow insulation and jacket to pass through unbroken. This applies to both hot and cold pipes.
2. Hangers in direct contact with bare copper pipe shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp within their temperature limits of -65°°F to +275°°F.

3. On all insulated piping, provide a semi-cylindrical metallic shield and vapor barrier jacket.
4. Ferrous hot piping 4 inches and larger shall have steel saddles tack welded to the pipe at each support with a depth not less than specified for the insulation. Factory fabricated inserts may be used.

    a. Products:

        1) Anvil Fig. 160, 161, 162, 163, 164, 165
        2) Eaton Fig. 3160, 3161, 3162, 3163, 3164, 3165
        3) nVent Model 630, 631, 632, 633, 634, 635

5. Unless otherwise indicated, hangers shall be as follows:

    a. Clevis Type: Service: Bare Metal Pipe, Rigid Plastic Pipe, Insulated Cold Pipe, Insulated Hot Pipe - 3 inches and Smaller:

        1) Products: Bare Steel, Plastic or Insulated Pipe:

            a) Anvil Fig. 260
            b) Eaton Fig. 3100
            c) nVent Model 400

        2) Products: Bare Copper Pipe:

            a) Eaton Fig. B3104F or B3100CTC
            b) Anvil Fig. CT65
            c) nVent Fig. 402

    b. Roller Type: Service: Insulated Hot Pipe - 4 inches and Larger:

        1) Products: 4" through 6":

            a) Anvil Fig. 181, 271
            b) Eaton Fig. 3110
            c) nVent Model 610

        2) Products: 8" and Above:

            a) Anvil Fig. 171, 271
            b) Eaton Fig. 3114, 3117
            c) nVent Model 605

c. Continuous Channel with Clevis Type: Service: Plastic Tubing, Flexible Hose, Soft Copper Tubing:

1) Products:

a) Eaton Fig. B3106, with Fig. B3106V
b) nVent Model 104, with Model 104V
c) Anvil Fig. 1V

d. Adjustable Swivel Ring Type: Service: Bare Metal Pipe - 4 inches and Smaller:

1) Products: Bare Steel Pipe:

a) Anvil Fig. 69
b) Eaton Fig. B3170NF
c) nVent Model 115

2) Products: Bare Copper Pipe:

a) Eaton Fig. B3170CTC
b) nVent 102A0 Series
c) Anvil Fig. CT-69

6. Support may be fabricated from U-channel strut or similar shapes. Piping less than 4" in diameter shall be secured to strut with clamps of proper design and capacity as required to maintain spacing and alignment. Strut shall be independently supported from hanger drops or building structure. Size and support shall be per manufacturer's installation requirements for structural support of piping. Clamps shall not interrupt piping insulation.

a. Strut used in mechanical spaces or otherwise dry areas shall have ASTM B633 electro-plated zinc finish.
b. Strut used in damp areas listed in hanger rods shall have ASTM A123 hot-dip galvanized finish applied after fabrication.

7. Unless otherwise indicated, pipe supports for use with struts shall be as follows:

a. Clamp Type: Service: Bare Metal Pipe, Rigid Plastic Pipe, Insulated Cold Pipe, Insulated Hot Pipe - 3 inches and smaller:

1) Clamps in direct contact with copper pipe shall include plastic pipe insert similar to Unistrut Cush-A-Clamp, Hydra-Zorb, nVent Cushion Clamp or Eaton Vibra-Clamp.
2) Pipes subject to expansion and contraction shall have clamps oversized to allow limited pipe movement.
3) Products: Bare Steel, Plastic or Insulated Pipe:

a) Unistrut Fig. P1100 or P2500
b) Eaton Fig. B2000 or B2400

c) Anvil Fig. AS1200
d) nVent USC

4) Products: Bare Copper Pipe:

a) Eaton Fig. BVT
b) nVent CADDY Cushion Clamp

b. Roller Type: Service: Insulated Hot Pipe - 4 inches and larger:

1) Products: 4" through 6":

a) Unistrut Fig. P2474
b) Eaton Fig. B218
c) Anvil Fig. ROL-12
d) nVent ROL12

2) Products: 8" and Above:

a) Unistrut Fig. P2474-1
b) Eaton Fig. B219
c) nVent Fig. ROL-13
d) Anvil AS1902

D. Upper (Structural) Attachments:

1. Unless otherwise shown, upper attachments for hanger rods or support struts shall be as follows:

a. Steel Structure Clamps: C-Type Wide Flange Beam Clamps (for use on top and/or bottom of wide flanges. Not permitted for use with bar-joists.):

1) Products:

a) Anvil Fig. 86
b) Eaton Fig. B3033/B3034
c) nVent Model 300 & 310

b. Scissor Type Beam Clamps (for use with bar-joists and wide flange):

1) Products:

a) Anvil Fig. 228, 292
b) Eaton Fig. B3054
c) nVent Model 360

c. Concentrically Loaded Open Web Joist Hangers (for use with bar joists):

1) Products:

a) MCL. M1, M2 or M3

d. Masonry Anchors: Fasten to concrete masonry units with expansion anchors or self-tapping masonry screws. For expansion anchors into hollow concrete block, use sleeve-type anchors designed for the specific application. Do not fasten in masonry joints. Do not use powder actuated fasteners, wooden plugs, or plastic inserts.

e. Steel Structure Welding:

1) Unless otherwise noted, hangers, clips, and auxiliary support steel may be welded in lieu of bolting, clamping, or riveting to the building structural frame. Take adequate precautions during all welding operations for fire prevention and protecting walls and ceilings from smoke damage.

f. Wood Anchors: Tension wood rod hanger for suspending 3/8" threaded rod. Zinc plated carbon steel.

1) Minimum allowable tension loads for Douglass Fir/Southern Pine:

a) 3/8" diameter rod; 2-1/2" shank: 600 lb./590 lb.
b) Load values are based on full shank penetration into wood member. Minimum edge distance 3/4". Minimum end distance 3-1/4".

2) Limitations:

a) Truss: Do not hang from wood trusses without truss manufacturer or Structural Engineer’s approval.
b) Sheetrock/Gypsum Ceiling: When drilling through non-wood materials (e.g., sheet rock, gypsum, etc.), increase shank length by depth of non-wood materials.
c) Plywood Flooring/Roofing: Do not hang from plywood floor or roofing.
d) Spacing: Refer to wood structure spacing of hangers.

3) Products:

a) Simpson RWV
b) DeWALT
c) ITI Sammys GT25

2.3 FOUNDATIONS, BASES, AND SUPPORTS

A. Basic Requirements:

1. Furnish and install foundations, bases, and supports (not specifically indicated on the Drawings or in the Specifications of either the General Construction or Mechanical work as provided by another Contractor) for mechanical equipment.
2. All concrete foundations, bases and supports, shall be reinforced. All steel bases and supports shall receive a prime coat of zinc chromate or red metal primer. After completion of work, give steel supports a final coat of gray enamel.

B. Supports:

1. Provide sufficient clips, inserts, hangers, racks, rods, and auxiliary steel to securely support all suspended material, equipment and conduit without sag.
2. Hang heavy equipment from concrete floors or ceilings with Architect/Engineer-approved concrete inserts, furnished and installed by the Contractor whose work requires them, except where indicated otherwise.

C. Grout:

1. Grout shall be non-shrinking premixed (Master Builders Company "Embecco"), unless otherwise indicated on the drawings or approved by the Architect/Engineer.
2. Use Mix No. 1 for clearances of 1" or less, and Mix No. 2 for all larger clearances.
3. Grout under equipment bases, around pipes, at pipe sleeves, etc., and where shown on the drawings.

2.4 OPENINGS IN FLOORS, WALLS AND CEILINGS

A. Exact locations of all openings for the installation of materials shall be determined by the Contractor and given to the General Contractor for installation or construction as the structure is built.

B. Coordinate all openings with other Contractors.

C. Hire the proper tradesman and furnish all labor, material and equipment to cut openings in or through existing structures, or openings in new structures that were not installed, or additional openings. Repair all spalling and damage to the satisfaction of the Architect/Engineer. Make saw cuts before breaking out concrete to ensure even and uniform opening edges.

D. Said cutting shall be at the complete expense of each Contractor. Failure to coordinate openings with other Contractors shall not exempt the Contractor from providing openings at Contractor's expense.

E. Do not cut structural members without written approval of the Architect or Structural Engineer.

F. Exposed Housing Penetrations: Seal pipes with surface temperature below 150°F, penetrating housings with conical stepped, white silicone, EPDM or neoprene pipe flashings and stainless steel clamps equal to Portals Plus Pipe Boots or Pipetite.

2.5 SLEEVES AND LINTELS

A. Each Contractor shall provide sleeves and lintels for all duct and pipe openings required for the Contractor's work in masonry walls and floors, unless specifically shown as being by others.

B. Fabricate all sleeves from standard weight black steel pipe or as indicated on the drawings. Provide continuous sleeve. Cut or split sleeves are not acceptable.

C. Fabricate all lintels for masonry walls from structural steel shapes or as indicated on the drawings. Have all lintels approved by the Architect or Structural Engineer.

D. Sleeves through the floors on exposed risers shall be flush with the ceiling, with planed squared ends extending 1" above the floor in unfinished areas, and flush with the floor in finished areas, to accept spring closing floor plates.

E. Sleeves shall not penetrate structural members or masonry walls without approval from the Structural Engineer. Sleeves shall then comply with the Architect/Engineer's design.

F. Openings through unexcavated floors and/or foundation walls below the floor shall have a smooth finish with sufficient annular space around material passing through opening so slight settling will not place stress on the material or building structure.

G. Install all sleeves concentric with pipes. Secure sleeves in concrete to wood forms. This Contractor is responsible for sleeves dislodged or moved when pouring concrete.

H. Where pipes rise through concrete floors that are on earthen grade, provide 3/4" resilient expansion joint material (e.g., foam, rubber, asphalt-coated fiber, bituminous-impregnated felt, or cork) wrapped around the pipe, the full depth of concrete, at the point of penetration. Secure to prevent shifting during concrete placement and finishing.

I. Size sleeves large enough to allow expansion and contraction movement. Provide continuous insulation wrapping.

2.6 ESCUTCHEON PLATES AND TRIM

A. Fit escutcheons to all insulated or uninsulated exposed pipes passing through walls, floors, or ceilings of finished rooms.

B. Escutcheons shall be heavy gauge, cold rolled steel, copper coated under a chromium plated finish, heavy spring clip, rigid hinge and latch.

C. Install galvanized steel (unless otherwise indicated) trim strip to cover vacant space and raw construction edges of all rectangular openings in finished rooms. This includes pipe openings.

2.7 PIPE PENETRATIONS

A. Seal all pipe penetrations. Seal non-rated walls and floor penetrations with grout or caulk. Backing material may be used.

B. Seal fire rated wall and floor penetrations with fire seal system as specified.

2.8 PIPE ANCHORS

A. Provide all items needed to allow adequate expansion and contraction of all piping. All piping shall be supported, guided, aligned, and anchored as required.

B. Repair all piping leaks and associated damage. Pipes shall not rub on any part of the building.

2.9 FINISH

A. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.1 HVAC SUPPORTS AND ANCHORS

A. General Installation Requirements:

1. Install all items per manufacturer's instructions.
2. Coordinate the location and method of support of piping systems with all installations under other Divisions and Sections of the Specifications.
3. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
4. Supports shall extend directly to building structure. Do not support piping from duct hangers unless coordinated with Sheet Metal Contractor prior to installation. Do not allow lighting or ceiling supports to be hung from piping supports.

B. Supports Requirements:

1. Where building structural steel is fireproofed, all hangers, clamps, auxiliary steel, etc., which attach to it shall be installed prior to application of fireproofing. Repair all fireproofing damaged during pipe installation.
2. Set all concrete inserts in place before pouring concrete.
3. Furnish, install and prime all auxiliary structural steel for support of piping systems that are not shown on the Drawings as being by others.
4. Install hangers and supports complete with lock nuts, clamps, rods, bolts, couplings, swivels, inserts and required accessories.
5. Hangers for horizontal piping shall have adequate means of vertical adjustment for alignment.

C. Pipe Requirements:

1. Support all piping and equipment, including valves, strainers, traps and other specialties and accessories to avoid objectionable or excessive stress, deflection, swaying, sagging or vibration in the piping or building structure during erection, cleaning, testing and normal operation of the systems.
2. Do not, however, restrain piping to cause it to snake or buckle between supports or to prevent proper movement due to expansion and contraction.
3. Support piping at equipment and valves so they can be disconnected and removed without further supporting the piping.
4. Piping shall not introduce strains or distortion to connected equipment.
5. Parallel horizontal pipes may be supported on trapeze hangers made of structural shapes and hanger rods; otherwise, pipes shall be supported with individual hangers.
6. Trapeze hangers may be used where ducts interfere with normal pipe hanging.
7. Provide additional supports where pipe changes direction, adjacent to flanged valves and strainers, at equipment connections and heavy fittings.
8. Provide at least one hanger adjacent to each joint in grooved end steel pipe with mechanical couplings.

D. Provided the installation complies with all loading requirements of truss and joist manufacturers, the following practices are acceptable:

1. Loads of 100 lbs. or less may be attached anywhere along the top or bottom chords of trusses or joists with a minimum 3' spacing between loads.
2. Loads greater than 100 lbs. must be hung concentrically and may be hung from top or bottom chord, provided one of the following conditions is met:

    a. The hanger is attached within 6" from a web/chord joint.
    b. Additional L2x2x1/4 web reinforcement is installed per manufacturer's requirements.

3. It is prohibited to cantilever a load using an angle or other structural component that is attached to a truss or joist in such a fashion that a torsional force is applied to that structural member.
4. If conditions cannot be met, coordinate installation with truss or joist manufacturer and contact Architect/Engineer.

E. After piping and insulation installation are complete, cut hanger rods back at trapeze supports so they do not extend more than 3/4" below bottom face of lowest fastener and blunt any sharp edges.

F. Do not exceed 25 lbs. per hanger and a minimum spacing of 2'-0" on center when attaching to metal roof decking (limitation not required with concrete on metal deck). This 25 lbs. load and 2'-0" spacing include adjacent electrical and architectural items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.

G. Do not exceed the manufacturer's recommended maximum load for any hanger or support.

H. Steel/Concrete Structure: Spacing of hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:

1. Steel and Fiberglass (Std. Weight or Heavier - Liquid Service):

   a. Maximum Spacing:

      1) 1-1/4" & under: 7'-0"
      2) 1-1/2": 9'-0"
      3) 2": 10'-0"
      4) 2-1/2": 11'-0"
      5) 3": 12'-0"
      6) 4" & larger: 12'-0"

2. Steel (Std. Weight or Heavier - Vapor Service):

   a. Maximum Spacing:

      1) 1-1/4" and under: 9'-0"
      2) 1-1/2": 12'-0"
      3) 2" & larger: 12'-0"

3. Hard Drawn Copper & Brass (Liquid Service):

   a. Maximum Spacing:

      1) 3/4" and under: 5'-0"
      2) 1": 6'-0"
      3) 1-1/4": 7'-0"
      4) 1-1/2" 8'-0"
      5) 2": 8'-0"
      6) 2-1/2": 9'-0"
      7) 3": 10'-0"
      8) 4": 12'-0"
      9) 6": 12'-0"

4. Hard Drawn Copper & Brass (Vapor Service):

   a. Maximum Spacing:

      1) 3/4" & under: 7'-0"
      2) 1": 8'-0"
      3) 1-1/4": 9'-0"
      4) 1-1/2": 10'-0"
      5) 2": 11'-0"
      6) 2-1/2" & larger: 12'-0"

5. Plastic Pipe:

a. Hangers shall be spaced based on the piping system manufacturer's instructions or, if no system instructions are available, space hangers at 4'-0" maximum centers.

6. Ultra-Flexible Pipe, Flexible Hose, and Soft Copper Tubing:

a. Continuous channel with hangers maximum 8'-0" OC.

I. Wood Structure: Spacing of hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:

1. Steel and Fiberglass (Std. Weight or Heavier - Liquid Service):

a. Maximum Spacing:

1) 1-1/4" & under: 7'-0"
2) 1-1/2": 9'-0"
3) 2": 10'-0"
4) 2-1/2": 11'-0"
5) 3": 12'-0"
6) 4" through 6": 12'-0"8": 9’¢-0"10": 6’¢-0"12": 4’¢-0"

2. Steel (Std. Weight or Heavier - Vapor Service):

a. Maximum Spacing:

1) 1-1/4" and under: 9'-0"
2) 1-1/2": 12'-0"
3) 2" & larger: 12'-0"
4) 2-1/2": 11'-0"
5) 3": 12'-0"
6) 4" through 8": 12'-0"
7) 10": 9’¢-0"
8) 12": 6’¢-0"

3. Hard Drawn Copper & Brass (Liquid Service):

a. Maximum Spacing:

1) 3/4" and under: 5'-0"
2) 1": 6'-0"
3) 1-1/4": 7'-0"
4) 1-1/2" 8'-0"
5) 2": 8'-0"
6) 2-1/2": 9'-0"
7) 3": 10'-0"
8) 4": 12'-0"
9) 6": 12'-0"

4. Hard Drawn Copper & Brass (Vapor Service):

    a. Maximum Spacing:

        1) 3/4" & under: 7'-0"
        2) 1": 8'-0"
        3) 1-1/4": 9'-0"
        4) 1-1/2": 10'-0"
        5) 2": 11'-0"
        6) 2-1/2" & larger: 12'-0"

5. Plastic Pipe:

    a. Hangers shall be spaced based on the piping system manufacturer's instructions or, if no system instructions are available, space hangers at 4'-0" maximum centers.

6. Ultra-Flexible Pipe, Flexible Hose, and Soft Copper Tubing:

    a. Continuous channel with hangers maximum 8'-0" OC.

J. Wood Structure: Spacing of hangers shall not exceed the compressive strength of the insulation inserts, and in no case shall exceed the following:

1. Steel and Fiberglass (Std. Weight or Heavier - Liquid Service):

    a. Maximum Spacing:

        1) 1-1/4" & under: 7'-0"
        2) 1-1/2": 9'-0"
        3) 2": 10'-0"
        4) 2-1/2": 11'-0"
        5) 3": 12'-0"
        6) 4" through 6": 12'-0"8": 9'-0"10": 6'-0"12": 4'-0"

2. Steel (Std. Weight or Heavier - Vapor Service):

    a. Maximum Spacing:

        1) 1/2" and under: 6'-0"
        2) 3/4" to 1": 8'-0"
        3) 1-1/4" and under: 9'-0"
        4) 1-1/2": 10'-0"
        5) 2" & larger: 10'-0"
        6) 3": 12'-0"
        7) 4" through 8": 12'-0"
        8) 10": 9'-0"
        9) 12": 6'-0"

3. Hard Drawn Copper & Brass (Liquid Service):

    a. Maximum Spacing:

        1) 3/4" & under: 5'-0"
        2) 1": 6'-0"
        3) 1-1/4": 6'-0"
        4) 1-1/2": 6'-0"
        5) 2": 8'-0"
        6) 2-1/2": 9'-0"
        7) 3": 10'-0"
        8) 4": 10'-0"
        9) 6": 10'-0"

4. Hard Drawn Copper & Brass (Vapor Service):

    a. Maximum Spacing:

        1) 3/4" & under: 6'-0"
        2) 1": 6'-0"
        3) 1-1/4": 6'-0"
        4) 1-1/2": 6'-0"
        5) 2": 10'-0"
        6) 2-1/2" & larger: 10'-0"

K. Installation of hangers shall conform to MSS SP-58, 69, and 89.

END OF SECTION

SECTION 23 51 00

BREECHINGS, CHIMNEYS, AND STACKS

(Part of Work of Section 23 00 01 – HVAC)

PART 1 - GENERAL

1.1 REFERENCES

A. ANSI Z181.1 (UL 959) - Medium Heat Appliance Factory Built Chimneys.

B. ANSI Z21.66 - Electrically Operated Automatic Vent Damper Devices for Use with Gas-Fired Appliances.

C. ANSI Z223.1 (NFPA 54) - The National Fuel Gas Code.

D. ANSI/ASTM C64 - Refractories for Incinerators and Boilers.

E. ANSI/UL 103 - Standard for Factory Built Chimneys for Residential Type and Building Heating Appliances.

F. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances.

G. UL 378 - Standard for Draft Equipment

H. UL 441 - Standard for Gas Vents.

I. UL 641 - Standard for Type L Low-Temperature Venting Systems.

1.2 SUBMITTALS

A. Submit shop drawings per Section 230500. Include general construction, dimensions, weights, support and layout of breechings. Where factory built units are used submit layout drawings indicating plan view and elevations.

B. Submit product data indicating factory built chimneys, including dimensional details of components and flue caps, dimensions and weights.

C. Submit engineering report and manufacturer's certificate that refractory lined metal stacks meet specified requirements.

D. Submit manufacturer's installation instructions.

1.3 DEFINITIONS

A. Breeching or Vent Connector: Conducts the flue gases from the flue collar of an appliance to a chimney or vent and may include a draft control device.

B. Chimney: Primarily vertical shaft enclosing at least one vent for conducting flue gases outdoors.

C. Combustion Air: Air that is supplied to combustion appliances to be used in the combustion of fuels and the process of venting combustion gases.

D. Smoke Pipe: Round, single wall vent connector.

E. Vent: Conveys flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.

1.4 DESIGN REQUIREMENTS

A. Factory built vents and chimneys used for venting natural draft appliances shall comply with NFPA 211 and be UL listed and labeled.

PART 2 - PRODUCTS

2.1 POSITIVE PRESSURE GAS VENTS AND INTAKES (NON-CONDENSING)

A. The venting system shall be ANSI/UL 103 listed for use in positive pressure applications. For use with equipment burning gas, liquid or solid fuels as described in NFPA 211, Section 2-3-.1 and Appendix A.

B. All products furnished under this Section shall conform to the requirements of NFPA 37 and NFPA 211 for exhaust gas temperatures not exceeding 1400°F continuously or 1800ºF intermittently. Products shall be listed to UL 103 positive pressure tested and listed to 60” w.c.; and shall carry the appropriate UL and $_{c}$UL listing mark or label.

C. The vent system shall be double wall metal with a minimum of 1" insulation between the walls. Outer wall shall be 316 stainless steel coated steel 0.034" thick.

D. The inner pipe shall be Type 316 stainless steel 0.035" thick in all sizes. All inner pipe joints shall be held together by means of formed vee bands.

E. All exhaust pipe parts exposed to the weather shall be protected by one (1) coat of corrosion and heat-resistant primer and one (1) coat heat resistant paint. Where exposed to weather, the outer bands shall be sealed with P077 Silicone Sealant. Paint shall be furnished and applied by installer.

F. Seal each inner pipe joint during field installation with PO71, high temperature sealant, for flue gas temperatures up to 600°F. For gas temperatures over 600°F, seal the joints with #33 joint cement, rated for 125% of design temperature.

G. Screws shall be of the hex-head type with shoulder stops and tapered “lead-in” threads for easy starting.

H. Nuts for the inner and outer bands shall be retained by means of a free-floating cage to allow easy alignment.

I. Seal clips should be used in conjunction with vee bands on diameters 6 thru 10 inch.

J. Manufacturers:

1. AMPCO
2. DuraVent
3. Hart & Cooley
4. Heat Fab
5. Metal-Fab
6. Schebler
7. Security (M&G Group)
8. Selkirk/Metalbestos
9. Van-Packer

PART 3 - EXECUTION

3.1 INSTALLATION

A. Prior to putting boilers into operation, Contractor shall provide full penetration welds for the entire length of each pipe section for all inner and outer shell seams to prevent leakage of flue gases. Riveted, tack, or spot-welded seams are not permitted.

B. Install all products in accordance with manufacturer's instructions.

C. Install in accordance with recommendations of ASHRAE - Handbook, Chapter "Chimney, Gas Vent, and Fireplace Systems", NFPA 211, and ANSI Z223.1 (NFPA 54).

D. Install breechings with minimum of joints. Align accurately at connections, with internal surfaces smooth.

E. Support breechings from building structure, rigidly with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Guide vertical breechings, chimneys, and stacks at 12 foot spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA HVAC Duct Construction Standards - Metal and Flexible for duct support configuration and size. Provide expansion compensation approved by the manufacturer.

F. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.

G. Install vent dampers near draft hood collars and secured to breechings.

H. Level and plumb chimneys and stacks. Provide 3/4" condensate cap at base of all chimneys and stacks over 6" diameter. Pipe condensate to nearest floor drain.

I. Clean breechings, chimneys, and stacks during installation, removing dust and debris.

J. Provide slip joints permitting removal of appliances without removal or dismantling of breechings, chimneys, or stacks.

3.2 ENGINE EXHAUST INSTALLATION

A. Pipe:

1. Install all pipe, fittings, and flanges.
2. Welded Joints (Steel Pipe):

    a. Welding of all pipe joints, both as to procedures and qualification of welders, shall be in accordance with Section IX, ASME "Boiler & Pressure Vessel Code" unless local codes take precedence.
    b. Furnish certificates qualifying each welder to the Owner's Representative prior to start of work.
    c. The Owner's Representative reserves the right to require qualifying demonstration, at the Contractor's expense, of any welders assigned to the job.
    d. Ends of pipe and fittings to be joined by butt-welding shall be beveled, cleaned to bare metal and internal diameters aligned before tack welding.

3. Install accessories per manufacturer's instructions, building codes and industry standards.

B. Insulation:

1. Install materials per manufacturer's instructions, building codes and industry standards.
2. Hydrous Calcium Silicate:

    a. Use pre-molded half sections. Butt longitudinal and circumferential joints tightly. Wire in place with 16 gauge stainless steel wire on maximum 12" centers.
    b. Apply in two layers. Stagger all joints between layers. Wire each layer individually.

3. Semi-Rigid Mineral Wool Fiberboard, Rigid Mineral Fiber Blocks:

    a. Apply with edges tightly butted, joints broken.
    b. Secure with 16 gauge galvanized, annealed steel wire or 1/2" x 0.015" galvanized steel bands, 12" maximum centers.
    c. Install welding studs, clips and angles where required to anchor wires and bands.

C. Insulation Jacket:

1. Provide metal jacket as specified. Completely cover all insulation with jacket seams located on the bottom of horizontal piping. Include fittings and joints.
2. Seal all joints with metal draw bands and sealant. Seal all joints watertight.

D. Install all work under the supervision of a licensed Ma plumbing contractor.

E. Prior to ordering of materials, submit to the Engineer a vent calculation based on the approved generator and field measured exhaust routing.

END OF SECTION

SECTION 260001

ELECTRICAL

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS and DIVISION 1 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

B. Reference Drawings: The electrical work of this bid is shown on the following Contract Drawings:

E100, E101, E102, E103, E200, E201, E400, E500, E501, E600

C. Reference Specifications:
1. SECTION 260500 BASIC ELECTRICAL REQUIREMENTS
2. SECTION 260505 ELECTRICAL DEMOLITION FOR REMODELING
3. SECTION 260513 WIRE AND CABLE
4. SECTION 260526 GROUNDING AND BONDING
5. SECTION 260527 SUPPORTING DEVICES
6. SECTION 260533 CONDUIT AND BOXES
7. SECTION 260553 ELECTRICAL IDENTIFICATION
8. SECTION 260573 POWER SYSTEM STUDY
9. SECTION 262413 SWITCHBOARDS
10. SECTION 262416 PANELBOARDS
11. SECTION 262816 DISCONNECT SWITCHES
12. SECTION 263213 PACKAGED ENGINE GENERATOR SYSTEMS
13. SECTION 263600 TRANSFER SWITCH

1.2 DESCRIPTION OF WORK

A. Work Included: Filed Sub-Bid Contractors shall refer to trade contractor sub-bid classes of work as defined under MGL Chapter 149A Section 8. Throughout the documents, Trade Contractors are also referred to as Filed Sub-Bids or Filed Sub-Bidders. Those terms shall be used interchangeably with Trade Contractor and shall have the same meaning as Trade Contractor under MGL 149A Section 8. Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
1. Furnishing and installation of penetration firestopping at wall penetrations, including labeling for identification of firestopping as specified in Section 078413 – PENETRATION FIRESTOPPING.

2. Furnishing and installation of acoustical sealants at wall penetrations as specified in Section 079200 – JOINT SEALANTS.

B. Bidders are required to examine the balance of Drawings listed in Section 000115 “List of Drawing Sheets” for coordination and reference purposes.

C. Furnish all labor, materials, equipment, plant, transportation, rigging, scaffolding, lifts, appurtenances, and services necessary and/or incidental to properly complete all work as shown on the Drawings and described in the Specifications.

END OF SECTION

SECTION 26 05 00

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Requirements applicable to all Division 26 Sections. Also refer to Division 1 - General Requirements.

B. All materials and installation methods shall conform to the applicable standards, guidelines and codes referenced herein and within each specification section.

1.2 REFERENCES

A. NFPA 70 - National Electrical Code (NEC).

1.3 SCOPE OF WORK

A. This Specification and the associated drawings govern furnishing, installing, testing and placing into satisfactory operation the Electrical Systems.

B. The Contractor shall furnish and install all new materials as indicated on the drawings, and/or in these specifications, and all items required to make the portion of the Electrical Work a finished and working system.

C. All work will be awarded under a single General Contract. The division of work listed below is for the Contractor's convenience and lists normal breakdown of the work.

D. Description of Systems shall be as follows:
1. Generator replacement.
2. Switchboard replacement.
3. Coordination for phasing of work.
4. New emergency panelboards.
5. Electrical power service system from the Utility Company to and including service entrance equipment, distribution and metering.
6. Grounding system.
7. Removal work and/or relocation and reuse of existing systems and equipment.
8. Splice and re-feed all existing emergency circuits from new panels.
9. Furnish and install firestopping systems for penetrations of fire-rated construction associated with this Contractor's work.

1.4 OWNER FURNISHED PRODUCTS

A. The Owner will supply manufacturer's installation data for Owner-purchased equipment for this project.

B. This Contractor shall make all electrical system connections shown on the drawings **or** required for fully functional units.

C. This Contractor is responsible for all damage to Owner furnished equipment caused during installation.

1.5 WORK SEQUENCE

A. All work that will produce excessive noise or interference with normal building operations, as determined by the Owner, shall be scheduled with the Owner. It may be necessary to schedule such work during unoccupied hours. The Owner reserves the right to determine when restricted construction hours are required.

B. Itemize all work and list associated hours and pay scale for each item.

1.6 COORDINATION DRAWINGS

A. Definitions:

1. Coordination Drawings: A compilation of the pertinent layout and system drawings that show the sizes and locations, including elevations, of system components and required access areas to ensure that no two objects will occupy the same space.

    a. Electrical trades shall include, but are not limited to, electrical equipment, conduit 1.5" and larger, conduit racks, cable trays, pull boxes, transformers, raceway, busway, lighting, ceiling-mounted devices, and any item that may impact coordination with other disciplines.
    b. Maintenance clearances and code-required dedicated space shall be included.
    c. The coordination drawings shall include all underground, underfloor, in-floor, in chase, and vertical trade items.

2. The contractors shall use the coordination process to identify the proper sequence of installation of all utilities above ceilings and in other congested areas, to ensure an orderly and coordinated end result, and to provide adequate access for service and maintenance.

B. Participation:

1. The contractors and subcontractors responsible for work defined above shall participate in the coordination drawing process.
2. One contractor shall be designated as the Coordinating Contractor for purposes of preparing a complete set of composite electronic CAD coordination drawings that include all applicable trades, and for coordinating the activities related to this process. The Coordinating Contractor for this project shall be the Electrical Contractor. .

    a. The Coordinating Contractor shall utilize personnel familiar with requirements of this project and skilled as draftspersons/CAD operators, competent to prepare the required coordination drawings.

3. Electronic CAD drawings shall be submitted to the Coordinating Contractor for addition of work by other trades. IMEG will provide electronic file copies of ventilation drawings for contractor's use if the contractor signs and returns an "Electronic File Transfer" waiver provided by IMEG. IMEG will not consider blatant reproductions of original file copies an acceptable alternative for coordination drawings.

C. Drawing Requirements:

1. The file format and file naming convention shall be coordinated with and agreed to by all contractors participating in the coordination process and the Owner.

    a. Scale of drawings:

        1) General plans: 1/4 Inch = 1 '-0" (minimum).
        2) Mechanical, electrical, communication rooms, and including the surrounding areas within 10 feet: 1/2 Inch = 1'-0" (minimum).
        3) Shafts and risers: 1/2 Inch = 1'-0" (minimum).
        4) Sections of shafts and mechanical and electrical equipment rooms: 1/4 Inch = 1 '-0" (minimum).
        5) Sections of congested areas: 1/2 Inch = 1'-0" (minimum).

2. There may be more drawings required for risers, top and bottom levels of mechanical rooms, and shafts.
3. The minimum quantity of drawings will be established at the first coordination meeting and sent to the Architect/Engineer for review. Additional drawings may be required if other areas of congestion are discovered during the coordination process.

D. General:

1. Coordination drawing files shall be made available to the Architect/Engineer and Owner's Representative. The Architect/Engineer will only review identified conflicts and give an opinion, but will not perform as a coordinator.
2. A plotted set of coordination drawings shall be available at the project site.

3. Coordination drawings are not shop drawings and shall not be submitted as such.
4. The contract drawings are schematic in nature and do not show every fitting and appurtenance for each utility. Each contractor is expected to have included in the bid sufficient fittings, material, and labor to allow for adjustments in routing of utilities made necessary by the coordination process and to provide a complete and functional system.
5. The contractors will not be allowed additional costs or time extensions due to participation in the coordination process.
6. The contractors will not be allowed additional costs or time extensions for additional fittings, reroutings or changes of duct size, that are essentially equivalent sizes to those shown on the drawings and determined necessary through the coordination process.
7. The Architect/Engineer reserves the right to determine space priority of equipment in the event of spatial conflicts or interference between equipment, piping, conduit, ducts, and equipment provided by the trades.
8. Changes to the contract documents that are necessary for systems installation and coordination shall be brought to the attention of the Architect/Engineer.
9. Access panels shall preferably occur only in gypsum board walls or plaster ceilings where indicated on the drawings.

    a. Access to mechanical, electrical, technology, and other items located above the ceiling shall be through accessible lay-in ceiling tile areas.
    b. Potential layout changes shall be made to avoid additional access panels.
    c. Additional access panels shall not be allowed without written approval from the Architect/Engineer at the coordination drawing stage.
    d. Providing additional access panels shall be considered after other alternatives are reviewed and discarded by the Architect/Engineer and the Owner's Representative.
    e. When additional access panels are required, they shall be provided without additional cost to the Owner.

10. Complete the coordination drawing process and obtain sign-off of the drawings by all contractors prior to installing any of the components.
11. Conflicts that result after the coordination drawings are signed off shall be the responsibility of the contractor or subcontractor who did not properly identify their work requirements, or installed their work without proper coordination.
12. Updated coordination drawings that reflect as-built conditions may be used as record documents.

Referenced Specification Section	Submittal Item
26 05 13	Wire and Cable
26 05 26	Grounding and Bonding
26 05 33	Conduit and Boxes
26 05 53	Electrical Identification
26 05 73	Power System Study
26 20 00	Service Entrance
26 24 13	Switchboards
26 24 16	Panelboards
26 28 16	Disconnect Switches
26 32 13	Packaged Engine Generator Systems

Referenced Specification Section	Submittal Item
26 36 00	Transfer Switch

1.7 SCHEDULE OF VALUES

A. The requirements herein are in addition to the provisions of Division 1.

B. Format:

1. Use AIA Document Continuation Sheets G703 or another similar form approved by the Owner and Architect/Engineer.
2. Submit in Excel format.
3. Support values given with substantiating data.

C. Preparation:

1. Itemize work required by each specification section and list all providers. All work provided by subcontractors and major suppliers shall be listed on the Schedule of Values. List each subcontractor and supplier by company name.
2. Break down all costs into:

    a. Material: Delivered cost of product with taxes paid.
    b. Labor: Labor cost, excluding overhead and profit.

3. Itemize the cost for each of the following:

    a. Overhead and profit.
    b. Bonds.
    c. Insurance.
    d. General Requirements: Itemize all requirements.

4. For each line item having an installed cost of more than $5,000, break down costs to list major products or operations under each item. At a minimum, provide material and labor cost line items for the following:

    a. Each piece of equipment requiring shop drawings. Use the equipment nomenclature (SB-1, PANEL P-1, etc.) on the Schedule of Values.
    b. Each type of small unitary equipment (e.g., FDS, FCS, CS, etc.). Multiple units of the same type can be listed together provided quantities are also listed so unit costs can be determined.
    c. Each conduit system (medium voltage, normal, emergency, low voltage systems, etc.). In addition, for larger projects breakdown the material and labor for each conduit system based on geography (building, floor, and/or wing).

d. Fire alarm broken down into material and labor for the following:

1) Engineering
2) Controllers, devices, sensors, etc.
3) Conduit
4) Wiring
5) Programming
6) Commissioning

e. Site utilities (5' beyond building)
f. Seismic design
g. Testing
h. Commissioning
i. Record drawings
j. Punchlist and closeout

D. Update Schedule of Values when:

1. Indicated by Architect/Engineer.
2. Change of subcontractor or supplier occurs.
3. Change of product or equipment occurs.

1.8 CHANGE ORDERS

A. A detailed material and labor takeoff shall be prepared for each change order, along with labor rates and markup percentages. Change orders shall be broken down by sheet or associated individual line item indicated in the change associated narrative, whichever provides the most detailed breakdown. Change orders with inadequate breakdown will be rejected.

B. Itemized pricing with unit cost shall be provided from all distributors and associated subcontractors.

C. Change order work shall not proceed until authorized.

1.9 PRODUCT DELIVERY, STORAGE, HANDLING and MAINTENANCE

A. Exercise care in transporting and handling to avoid damage to materials. Store materials on the site to prevent damage.

B. Protect equipment, components, and openings with airtight covers and exercise care at every stage of storage, handling, and installation of equipment to prevent airborne dust and dirt from entering or fouling equipment to include, but not limited to:

1. Distribution equipment - branch panels, distribution panels, switchboards, motor control centers, etc.
2. Variable frequency drives.
3. Transformers, ventilated.
4. Electronic equipment, UPS, harmonic filters, power factor correction.
5. Lighting luminaires and lighting control systems.

C. Equipment and components that are visibly damaged or have been subject to environmental conditions prior to building turnover to Owner that could shorten the life of the component (for example, water damage, humidity, dust and debris, excessive hot or cold storage location, etc.) shall be repaired or replaced with new equipment or components without additional cost to the building owner.

D. Keep all materials clean, dry and free from damaging environments.

E. Coordinate the installation of heavy and large equipment with the General Contractor and/or Owner. If the Electrical Contractor does not have prior documented experience in rigging and lifting similar equipment, he/she shall contract with a qualified lifting and rigging service that has similar documented experience. Follow all equipment lifting and support guidelines for handling and moving.

F. Contractor is responsible for moving equipment into the building and/or site. Contractor shall review site prior to bid for path locations and any required building modifications to allow movement of equipment. Contractor shall coordinate the work with other trades.

1.10 NETWORK / INTERNET CONNECTED EQUIPMENT

A. These specifications may require certain equipment or systems to have network, Internet and/or remote access capability ("Network Capability"). Any requirement for Network Capability shall be interpreted only as a functional capability and is not to be construed as authority to connect or enable any Network Capability. Network Capability may only be connected or enabled with the express written consent of the Owner.

B. The following network connected equipment shall be equipped with restricted access protocols:

1. Adjustable trip overcurrent protection devices
2. Power monitoring and control
3. Electrical controls
4. Lighting control system
5. Variable frequency drives
6. Package engine generator and remote annunciator
7. Transfer switch and remote annunciator
8. Static uninterruptible power supply (UPS)
9. Fire alarm and automatic detection

1.11 WARRANTY

A. Provide one-year warranty for all fixtures, equipment, materials, and workmanship.

B. The warranty period for all work in this specification Division shall commence on the date of Substantial Completion or successful system performance whichever occurs later. The warranty may also commence if a whole or partial system or any separate piece of equipment or component is put into use for the benefit of any party other than the installing contractor with prior written authorization of the Owner. In this instance, the warranty period shall commence on the date when such whole system, partial system or separate piece of equipment or component is placed in operation and accepted in writing by the Owner.

C. Warranty requirements extend to correction, without cost to the Owner, of all work found to be defective or nonconforming to the contract documents. The Contractor shall bear the cost of correcting all damage due to defects or nonconformance with contract documents excluding repairs required as a result of improper maintenance or operation, or of normal wear as determined by the Architect/Engineer.

1.12 INSURANCE

A. This Contractor shall maintain insurance coverage as set forth in Division 1 of these specifications.

1.13 MATERIAL SUBSTITUTION

A. Where several manufacturers' names are given, the manufacturer for which a catalog number is given is the basis for job design and establishes the quality.

B. Equivalent equipment manufactured by the other listed manufacturers may be used. Contractor shall ensure that all items submitted by these other manufacturers meet all requirements of the drawings and specifications and fits in the allocated space. When using other listed manufacturers, the Contractor shall assume responsibility for any and all modifications necessary (including, but not limited to structural supports, electrical connections and rough-in, and regulatory agency approval, etc.) and coordinate such with other contractors. The Architect/Engineer shall make the final determination of whether a product is equivalent.

C. Any material, article or equipment of other unnamed manufacturers which will adequately perform the services and duties imposed by the design and is of a quality equal to or better than the material, article or equipment identified by the drawings and specifications may be used if approval is secured in writing from the Architect/Engineer via addendum. The Contractor assumes all costs incurred as a result of using the offered material, article or equipment, on the Contractors part or on the part of other Contractors whose work is affected.

D. Voluntary add or deduct prices for alternate materials may be listed on the bid form. These items will not be used in determining the low bidder. This Contractor assumes all costs incurred as a result of using the offered material or equipment on the Contractors part or on the part of other Contractors whose work is affected.

E. All material substitutions requested after the final addendum must be listed as voluntary changes on the bid form.

PART 2 - PRODUCTS

2.1 GENERAL

A. All items of material having a similar function (e.g., safety switches, panelboards, switchboards, contactors, motor starters, dry type transformers) shall be of the same manufacturer unless specifically stated otherwise on drawings or elsewhere in specifications.

PART 3 - EXECUTION

3.1 JOBSITE SAFETY

A. Neither the professional activities of the Architect/Engineer, nor the presence of the Architect/Engineer or the employees and subconsultants at a construction site, shall relieve the Contractor and any other entity of their obligations, duties and responsibilities including, but not limited to, construction means, methods, sequence, techniques or procedures necessary for performing, superintending or coordinating all portions of the work of construction in accordance with the contract documents and any health or safety precautions required by any regulatory agencies. The Architect/Engineer and personnel have no authority to exercise any control over any construction contractor or other entity or their employees in connection with their work or any health or safety precautions. The Contractor is solely responsible for jobsite safety. The Architect/Engineer and the Architect/Engineer's consultants shall be indemnified and shall be made additional insureds under the Contractor's general liability insurance policy.

3.2 ARCHITECT/ENGINEER OBSERVATION OF WORK

A. The contractor shall provide seven (7) calendar days' notice to the Architect/Engineer prior to:

1. Placing fill over underground and underslab utilities.
2. Covering exterior walls, interior partitions and chases.
3. Installing hard or suspended ceilings and soffits.

B. The Architect/Engineer will review the installation and provide a written report noting deficiencies requiring correction. The contractor's schedule shall account for these reviews and show them as line items in the approved schedule.

C. Above-Ceiling Final Observation:

1. All work above the ceilings must be complete prior to the Architect/Engineer's review. This includes, but is not limited to:

   a. All junction boxes are closed and identified in accordance with Section 26 05 53 Electrical Identification.
   b. Luminaires, including ceiling-mounted exit and emergency lights, are installed and operational.
   c. Luminaire whips are supported above the ceiling.
   d. Conduit identification is installed in accordance with Section 26 05 53 Electrical Identification.
   e. Luminaires are suspended independently of the ceiling system when required by these contract documents.
   f. All wall penetrations have been sealed.

2. To prevent the Above-Ceiling Final Observation from occurring too early, the Contractor shall review the status of the work and certify, in writing, that the work is ready for the Above-Ceiling Final Observation.

3. It is understood that if the Architect/Engineer finds the ceilings have been installed prior to this review and prior to seven days elapsing, the Architect/Engineer may not recommend further payments to the contractor until full access has been provided.

3.3 INSTRUCTING THE OWNER'S REPRESENTATIVE

A. Adequately instruct the Owner's designated representatives in the maintenance, care, and operation of the complete systems installed under this contract.

B. Provide verbal and written instructions to the Owner's representatives by FACTORY PERSONNEL in the care, maintenance, and operation of the equipment and systems.

C. Contractor shall make a video recording of instructions to the Owner while explaining the system so additional personnel may view the instructions at a later date. The video recording shall be the property of the Owner.

D. The Owner has the option to make a video recording of all instructions. Coordinate schedule of instructions to facilitate this recording.

E. The instructions shall include:

1. Maintenance of equipment.
2. Start-up procedures for all major equipment.
3. Description of emergency system operation.

F. Notify the Architect/Engineer of the time and place for the verbal instructions to be given to the Owner's representative so a representative can be present if desired.

G. Minimum hours of instruction time for each item and/or system shall be as indicated in each individual specification section.

H. Operating Instructions:

1. Contractor is responsible for all instructions to the Owner's representatives for the electrical and specialized systems.
2. If the Contractor does not have staff that can adequately provide the required instructions, the Contractor shall include in the bid an adequate amount to reimburse the Owner for the Architect/Engineer to perform these services.

3.4 RECORD DOCUMENTS

A. The following paragraphs supplement Division 1 requirements.

B. Maintain at the job site a separate and complete set of electrical drawings and specifications with all changes made to the systems clearly and permanently marked in complete detail.

C. Mark drawings and specifications to indicate approved substitutions; Change Orders, and actual equipment and materials used. All Change Orders, RFI responses, Clarifications and other supplemental instructions shall be marked on the documents. Record documents that merely reference the existence of the above items are not acceptable. Should this Contractor fail to complete Record Documents as required by this contract, this Contractor shall reimburse Architect/Engineer for all costs to develop record documents that comply with this requirement. Reimbursement shall be made at the Architect/Engineer's hourly rates in effect at the time of work.

D. Record changes daily and keep the marked drawings available for the Architect/Engineer's examination at any normal work time.

E. Upon completing the job, and before final payment is made, give the marked-up drawings to the Architect/Engineer.

F. Record actual routing of conduits exceeding [**2**] inches.

3.5 ADJUST AND CLEAN

A. Thoroughly clean all equipment and systems prior to the Owner's final acceptance of the project.

B. Clean all foreign paint, grease, oil, dirt, labels, stickers, etc. from all equipment.

C. Remove all rubbish, debris, etc., accumulated during construction from the premises.

3.6 SPECIAL REQUIREMENTS

A. Coordinate the installation of all equipment, controls, devices, etc., with other trades to maintain clear access area for servicing.

B. Install all equipment to maximize access to parts needing service or maintenance. Review the final location, placement, and orientation of equipment with the Owner's representative prior to setting equipment.

C. Installation of equipment or devices without regard to coordination of access requirements and confirmation with the Owner's representative will result in removal and reinstallation of the equipment at the Contractor's expense.

D. Raceway and Cable Routing Restrictions: Raceways and cable are restricted from being routed in the following locations, unless serving the space or permitted by the authority having jurisdiction.

1. Elevator machine rooms and hoistways.
2. Exit enclosures.
3. Other areas restricted by code.
4. Technology, data, server rooms.
5. Fire pump and sprinkler rooms.

6. Normal power in emergency power equipment rooms: Limited to feeders and branch circuits serving the emergency power equipment located in the room.
7. Emergency power in normal power equipment rooms: Limited to feeders and branch circuits serving the normal power equipment located in the room.

3.7 SYSTEM STARTING AND ADJUSTING

A. The electrical systems shall be complete and operating. System startup, testing, adjusting, and balancing to obtain satisfactory system performance is the responsibility of the Contractor. This includes all calibration and adjustment of electrical controls, balancing of loads, troubleshooting and verification of software, and final adjustments that may be needed.

B. Complete all manufacturer-recommended startup procedures and checklists to verify proper equipment operation and does not pose a danger to personnel or property.

C. All operating conditions and control sequences shall be tested during the start-up period. Testing all interlocks, safety shut-downs, controls, and alarms.

D. The Contractor, subcontractors, and equipment suppliers shall have skilled technicians to ensure that all systems perform properly. If the Architect/Engineer is requested to visit the job site for trouble shooting, assisting in start-up, obtaining satisfactory equipment operation, resolving installation and/or workmanship problems, equipment substitution issues or unsatisfactory system performance, including call backs during the warranty period, through no fault of the design; the Contractor shall reimburse the Owner on a time and materials basis for services rendered at the Architect/Engineer's standard hourly rates in effect when the services are requested. The Contractor shall pay the Owner for services required that are product, installation or workmanship related. Payment is due within 30 days after services are rendered.

3.8 FIELD QUALITY CONTROL

A. General:

1. Conduct all tests required during and after construction. Submit test results in NETA format, or equivalent form, that shows the test equipment used, calibration date, tester's name, ambient test conditions, humidity, conductor length, and results corrected to 40°C.
2. Supply necessary instruments, meters, etc., for the tests. Supply competent technicians with training in the proper testing techniques.
3. All cables and wires shall be tested for shorts and grounds following installation and connection to devices. Replace shorted or grounded wires and cables.
4. Any wiring device, electrical apparatus or luminaire, if grounded or shorted on any integral "live" part, shall have all defective parts or materials replaced.
5. Test cable insulation of service and panel feeder conductors for proper insulation values. Tests shall include the cable, all splices, and all terminations. Each conductor shall be tested and shall test free of short circuits and grounds and have an insulation value not less than Electrical Code Standards. Take readings between conductors, and between conductors and ground.
6. If the results obtained in the tests are not satisfactory, make adjustments, replacements, and changes as needed. Then repeat the tests, and make additional tests, as the Architect/Engineer or authority having jurisdiction deems necessary.

B. Ground Resistance:

1. Conduct service ground resistance tests using an approved manufactured ground resistance meter. Submit to the Architect/Engineer a proposed test procedure including type of equipment to be used. (The conventional ohmmeter is not an acceptable device.)
2. Make ground resistance measurements during normal dry weather and not less than 48 hours after a rain. Ground resistance values shall be verified by the Architect/Engineer at the time the readings are taken.
3. If the ground resistance value obtained is more than the value set forth in Section 26 05 26, the following shall be done to obtain the value given:

    a. Verify that all connections in the service ground system are secure.
    b. Increase the depth to which ground rods are driven by adding section lengths to the rods and retest. If the resistance is still excessive increase the depth by adding an additional rod section and retest.
    c. If the resistance is still excessive, furnish and install additional ground rods, spaced not less than 20 feet from other ground rods unless otherwise noted on plans, and connect into the ground electrode system. Retest.
    d. Review results with the Architect/Engineer.

4. Before final payment is made to the Contractor submit a written report to the Architect/Engineer including the following:

    a. Date of test.
    b. Number of hours since the last rain.
    c. Soil condition at the time of the test in the ground electrode location. That is: dry, wet, moist, sand, clay, etc.
    d. Diagram of the test set-up showing distances between test equipment, ground electrode, auxiliary electrodes, etc.
    e. Make, model, and calibration date of test equipment.
    f. Tabulation of measurements taken and calculations made.

C. Ground-Fault Equipment Performance Testing:

1. Test: Perform ground-fault performance testing when system is installed. The test process shall use primary current injection per manufacturer instruction and procedures. Perform test for the following:

    a. Service disconnects
    b. Solid state molded case circuit breakers and solid-state insulated case circuit breakers equipped with ground fault protection.
    c. Fusible switches with ground fault relay protection.
    d. Outside branch circuits and feeders.
    e. Code required.

2. Report: Provide copy of test result report with Operation and Maintenance manuals. Provide report to Authority Having Jurisdiction when requested.

D. Arc Energy Reduction Equipment Performance Testing:

1. Test: Perform arc energy protection performance testing when system is installed. The test process shall use primary current injection or approved method per manufacturer instructions and procedures. Perform test for the following:

a. All arc energy reduction systems installed.

2. Report: Provide copy of test result report with Operation and Maintenance manuals. Provide report to Authority Having Jurisdiction when requested.

E. Other Equipment:

1. Give other equipment furnished and installed by the Contractor all standard tests normally made to assure that the equipment is electrically sound, all connections properly made, phase rotation correct, fuses and thermal elements suitable for protection against overloads, voltage complies with equipment nameplate rating, and full load amperes are within equipment rating.

F. If any test results are not satisfactory, make adjustments, replacements and changes as needed and repeat the tests and make additional tests as the Architect/Engineer or authority having jurisdiction deem necessary.

G. Contractor shall thermographic study all electrical gear, switchboard, panelboards, etc. at the end of construction to identify any unusual conditions/heating within the equipment. Coordinate with Owner/Architect/Engineer to have an Owner/Architect/Engineer representative present during testing.

H. Report shall include color printouts, in binder, of pictures taken to use as a baseline reading after building is occupied.

I. Upon completion of the project, the Contractor shall provide amperage readings for all panelboards and switchboards and turn the results over to the Owner for "benchmark" amperages.

3.9 UTILITY REBATE

A. Submit utility rebate forms, where offered at project location, with rebate items completed. Rebate may include lighting, lighting controls, variable speed drives, heat pumps, package terminal A/C, air conditioners, chillers, water heaters, programmable thermostats, and motors.

B. Contractor must submit notification of any value engineering or product substitution that will affect the utility rebate amount prior to approval.

READINESS CERTIFICATION PRIOR TO FINAL JOBSITE OBSERVATION

To prevent the final job observation from occurring too early, we require that the Contractor review the completion status of the project and, by copy of this document, certify that the job is indeed ready for the final job observation. The following is a typical list of items that represent the degree of job completeness expected prior to your requesting a final job observation.

1. Penetrations of fire-rated construction fire sealed in accordance with specifications.
2. Electrical panels have typed circuit identification.
3. Smoke and fire/smoke dampers are wired and have been tested.
4. Per Section 26 05 00, cable insulation test results have been submitted.
5. Per Section 26 05 00, medium voltage testing report has been submitted.
6. Per Section 26 05 00, ground resistance test results have been submitted.
7. Operation and Maintenance manuals have been submitted as per Section 26 05 00.
8. Bound copies of approved shop drawings have been submitted as per Section 26 05 00.
9. Report of instruction of Owner's representative has been submitted as per Section 26 05 00.
10. Fire alarm inspection and testing report has been submitted as per Sections 26 05 00 and 28 31 00.
11. Start-up reports from factory representative have been submitted as per Section 26 05 00.

Accepted by:

Prime Contractor _____

By _____ Date _____

Upon Contractor certification that the project is complete and ready for a final job observation, we require the Contractor to sign this agreement and return it to the Architect/Engineer so that the final observation can be scheduled.

It is understood that if the Architect/Engineer finds the job not ready for the final observation and that additional trips and observations are required to bring the project to completion, the costs incurred by the Architect/Engineers for additional time and expenses will be deducted from the Contractor's contract retainage prior to final payment at the completion of the job.

END OF SECTION

SECTION 26 05 05

ELECTRICAL DEMOLITION FOR REMODELING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Electrical demolition.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work shall be as specified in individual Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The drawings are intended to indicate the scope of work required and do not indicate every box, conduit, or wire that must be removed. The contractor shall visit the site prior to submitting a bid and verify existing conditions.

B. Where walls, ceilings, structures, etc., are indicated as being removed on general or electrical drawings, the Contractor shall be responsible for the removal of all electrical equipment, devices, fixtures, raceways, wiring, systems, etc., from the removed area.

C. Where ceilings, walls, structures, etc., are temporarily removed and replaced by others, this Contractor shall be responsible for the removal, storage, and replacement of equipment, devices, fixtures, raceways, wiring, systems, etc.

D. Where mechanical or technology equipment is indicated as being removed on electrical, mechanical, or technology drawings, the Contractor shall be responsible for disconnecting the equipment and removing all starters, VFD, controllers, electrical equipment, raceways, wiring, etc. associated with the device.

E. Verify that abandoned wiring and equipment serve only abandoned equipment or facilities. Extend conduit and wire to facilities and equipment that will remain in operation following demolition. Extension of conduit and wire to equipment shall be compatible with the surrounding area. Extended conduit and conductors to match existing size and material.

F. Coordinate scope of work with all other Contractors and the Owner at the project site. Schedule removal of equipment and electrical service to avoid conflicts.

G. Bid submittal shall mean the Contractor has visited the project site and has verified existing conditions and scope of work.

3.2 PREPARATION

A. This is a 24/7 facility. The Contractor shall obtain approval from the Owner before turning off power to circuits, feeders, panels, etc. Coordinate all outages and lengths of downtimes with Owner.

B. Coordinate utility service outages with Utility Company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. Assume all equipment and systems must remain operational unless specifically noted otherwise on drawings.

D. Disconnect electrical systems in walls, floors, structures, and ceilings scheduled for removal.

E. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 48 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area. Service changeover shall be completed on an overtime basis.

F. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Obtain permission from Owner at least 48 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area. Provide a watchman to make required premise observations during all outages, requirements as dictated by codes and Owner's insurance carrier.

G. Temporary Generator System: Maintain temporary system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from the Owner at least 48 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area. System downtime shall occur on an overtime basis.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Demolish and extend existing electrical work under provisions of Division 1 of Specifications and this Section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring and raceway to source of supply. Existing conduit in good condition may be reused in place by including an equipment ground conductor in reused conduit. Reused conduit and boxes shall have supports revised to meet current codes. Relocating conduit shall not be allowed.

D. Remove exposed abandoned raceway, including abandoned raceway above accessible ceiling finishes. Cut raceway flush with walls and floors, and patch surfaces. Remove all associated clamps, hangers, supports, etc. associated with raceway removal.

E. Disconnect and remove outlets and devices that are to be demolished. Remove outlet or devices' associated back box, supports, and conduit and conductors back to source. Patch opening created from removal of device to match surrounding finishes.

F. Disconnect and remove abandoned panelboards and distribution equipment.

G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

H. Repair adjacent construction and finishes damaged during demolition and extension work. Patch openings to match existing surrounding finishes.

I. Maintain access to existing electrical installations that remain active. Modify installation or provide junction boxes and access panel as appropriate.

J. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified. Extended conduit and conductors to match existing size and material.

K. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

L. This Contractor is responsible for all costs incurred in repair, relocations, or replacement of any cables, conduits, or other services if damaged without proper investigation.

3.4 EXISTING ENCLOSURES - NEW EQUIPMENT

A. Existing enclosures may be reused to house new equipment including branch panels, industrial controls, and similar systems pending documented verification of the following provided with the applicable new equipment submittals.

1. New equipment or panelboard is listed for the existing enclosure or application.
2. Existing enclosure and new equipment is field evaluated by the manufacturer or nationally recognized testing laboratory for the available fault current, condition, and application.
3. Authority Having Jurisdiction (AHJ) approval.

3.5 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment that remain or are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

C. ELECTRICAL ITEMS (E.G., LIGHTING FIXTURES, RECEPTACLES, SWITCHES, CONDUIT, WIRE, ETC.) REMOVED AND NOT RELOCATED REMAIN THE PROPERTY OF THE OWNER. CONTRACTOR SHALL PLACE ITEMS RETAINED BY THE OWNER IN A LOCATION COORDINATED WITH THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF MATERIAL THE OWNER DOES NOT WANT.

3.6 INSTALLATION

A. Install relocated materials and equipment under the provisions of Division 1 of Specifications.

END OF SECTION

SECTION 26 05 13

WIRE AND CABLE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Building wire and cable 600V Insulation.

B. Type MI Cable Assembly.

C. Cabling for remote control, signal, and power limited circuits.

1.2 RELATED WORK

A. Section 26 05 53 - Electrical Identification: Refer to electrical identification for color and identification labeling requirements.

1.3 REFERENCES

A. ASTM B800-05 - Standard Specification for 8000 Series Aluminum Alloy Wire Electrical Purposes-Annealed and Intermediate Tempered.

B. ASTM B801-07 - Standard Specification for Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy for Subsequent Covering or Insulation.

C. NEMA WC 70 - Power Cables Rated 2,000V or Less for the Distribution of Electrical Energy.

D. NFPA 70 - National Electrical Code (NEC).

E. UL 44 - Thermoset-Insulated Wires and Cables.

F. UL 83 - Thermoplastic-Insulated Wires and Cables.

G. UL 854 - Service-Entrance Cables.

H. UL 1581 - Standard for Electrical Wires, Cables, and Flexible Cords.

I. UL 2196 - Fire Resistive, Fire Resistant and Circuit Integrity Cables.

PART 2 - PRODUCTS

2.1 BUILDING WIRE

A. Feeders and Branch Circuits 8 AWG and larger: Copper, stranded conductor, 600-volt insulation, THHN/THWN or XHHW-2.

B. Feeders and Branch Circuits 8 AWG and larger in Underground Conduit: Copper, stranded conductor, 600-volt insulation, THWN or XHHW-2.

C. Feeders and Branch Circuits 10 AWG and Smaller: Copper, solid or stranded conductor, 600-volt insulation, THHN/THWN, unless otherwise noted on the drawings.

D. Control Circuits: Copper, stranded conductor 600-volt insulation, THHN/THWN.

E. Aluminum conductors are not to be used.

F. Each 120 and 277-volt branch circuit shall have a dedicated neutral conductor. Neutral conductors shall be considered current-carrying conductors for wire derating.

2.2 CABLING FOR REMOTE CONTROL, SIGNAL, AND POWER LIMITED CIRCUITS

A. Wire for the following specialized systems shall be as designated on the drawings, or elsewhere in these specifications. If not designated on the drawings or specifications, the system manufacturer's recommendations shall be followed.

1. Fire alarm
2. Low voltage switching and lighting control
3. Electronic control

2.3 TYPE MI CABLE ASSEMBLY

A. Acceptable fire-rated cables and listed assemblies:

1. Mineral Insulated Cables: Copper conductor, 600-volt insulation, rated 90°°C, Type MI.

a. Mineral-Insulated Metal-Sheathed Fire-Resistive Cables (Type MI) shall consist of a factory assembly of one or more solid copper conductors insulated with highly-compressed magnesium oxide and enclosed in a seamless, liquid-and -gas-tight continuous copper sheath. Cables shall be rated for 600 volts. Cable shall comply with Article 330 of the National Electrical Code. Cables shall be classified by Underwriters Laboratories, Inc. as having a 2-hour fire resistive rating. Cable terminations shall be made with UL listed mineral-insulated cable fittings suitable for terminations on standard lugs. Provide all necessary accessories, splices, and mounting hardware as required. Cables shall be as manufactured by Pyrotenax USA, Inc. or approved equal.

b. Type MI cable assemblies shall be delivered from the manufacturer with ends temporarily sealed against moisture ingress. When cables are cut in the field, the ends are to be sealed per manufacturer's requirements, but as a minimum, by means of standard sealing compound and PVC tape. Cables will be stored in a dry location.

c. Manufacturer:

1) Raychem Pyrotenax MI

PART 3 - EXECUTION

3.1 WIRE AND CABLE INSTALLATION SCHEDULE

A. Above Grade: All conductors installed above grade shall be type "THHN".

B. Underground or In Slab: All conductors shall be type "THWN".

C. Low Voltage Cable (less than 100 volts): Low voltage cables in ducts, plenums, and other air handling spaces shall be plenum listed. Low voltage cables in non-accessible areas shall be installed in conduit. Low voltage cable may be installed without conduit in accessible areas using the following types of cable supports. Cable support types/systems shall comply with the warranty requirements of the low voltage cable manufacturer.

D. Low Voltage Cable (less than 100 volts): Low voltage cable shall be installed in raceway.

E. Fire-Rated 2-Hour Feeders and Circuit Requiring Continuous Operation (CI): Refer to Part 2 of this section for acceptable products and assemblies. Installation shall meet UL 2196.

3.2 CONTRACTOR CHANGES

A. The basis of design is copper conductors installed in raceway based on ambient temperature of 30°C, NEC Table 310.16 (2011 - 2017 edition 310.15(B)(16)). Service entrance conductors are based on copper conductor installed in underground electrical ducts, NEC Table B.2(7) (2011 - 2017 edition Table B310.15(B)(2)(7); 2008 or later edition B.301.7) or calculated in accordance with Annex B Application Information for Ampacity Calculation.

B. The Contractor shall be responsible for derating and sizing conductors and conduits to equal or exceed the ampacity of the basis of design circuits if he/she chooses to use methods or materials other than the basis of design.

C. Underground electrical duct ampacity rating shall be in accordance with NEC Table 310.16 (2011 - 2017 edition 310.15(B)(16)) or calculated in accordance with Annex B Application Information for Ampacity Calculation. The calculations and a sketch of the proposed installation shall be submitted prior to any conduit being installed.

D. Conductor length(s) on plans are horizontally scalable but are not intended to represent the exact finished length. The drawings are diagrammatic with intent to convey the components of the electrical distribution system. Conductor length(s) from scaling drawings shall NOT be used for bidding purposes.

3.3 WIRING INSTALLATION IN RACEWAYS

A. Pull all conductors into a raceway at the same time. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires. Do not use wire pulling lubricant for isolated (ungrounded) power system wiring.

B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.

C. Pulling shall be continuous without unnecessary stops and starts with wire or cable only partially through raceway.

D. Where reels of cable or wire are used, they shall be set up on jacks close to the point where the wire or cable enters the conduit or duct so that the cable or wire may be unreeled and run into the conduit or duct with a minimum of change in the direction of the bend.

E. Conductors shall not be pulled through conduits until plastering or masonry work is completed and conduits are free from moisture. Care shall be taken so that long pulls of wire or pulls around several bends are not made where the wire may be permanently stretched and the insulation damaged.

F. Only nylon rope shall be permitted to pull cables into conduit and ducts.

G. Completely and thoroughly swab raceway system before installing conductors.

H. Conductor Supports in Vertical Raceways:

1. Support conductors in vertical raceways in accordance with the Electrical Code Spacing of Conductors Supports.
2. Supports shall be of insulated wedge type (OZ Gedney Type S, or equal) and installed in a tapered insulated bushing fitting or a metal woven mesh with a support ring that fits inside conduit fitting installed in an accessible junction box (Hubbell Kellems support grip or equal).

3.4 CABLE INSTALLATION

A. Provide protection for exposed cables where subject to damage.

B. Use suitable cable fittings and connectors.

C. Run all open cable parallel or perpendicular to walls, ceilings, and exposed structural members. Follow the routing as illustrated on the drawings as closely as possible. Cable routing on drawings scaled 1/4"=1'-0" or less shall be considered diagrammatical, unless noted otherwise. The correct routing, when shown diagrammatically, shall be chosen by the Contractor based on information in the contract documents; in accordance with the manufacturer's written instructions, applicable codes, the NECA's "Standard of Installation", recognized industry standards; and coordinated with other contractors.

D. Open cable shall be supported by the appropriate size J-hooks or other means if called for on the drawings. Wire and cable from different systems shall not be installed in the same J-hook. J-hooks shall be sized with 20% spare capacity. J-hooks shall provide proper bend radius support for data cable and fiber cables.

E. Open cable installed above suspended ceilings shall not rest on the suspended ceiling construction, nor utilize the ceiling support system for wire and cable support.

F. J-hook support spans shall be based on the smaller of the manufacturer's load ratings and code requirements. In no case shall horizontal spans exceed 5 feet and vertical spans exceed 4 feet. All J-hooks shall be installed where completely accessible and not blocked by piping, ductwork, inaccessible ceilings, etc. J-hooks shall be independently rigidly attached to a structural element. J-hooks shall be installed to provide 2" horizontal separation and 6" vertical separation between systems.

G. Open cable shall only be installed where specifically shown on the drawings, or permitted in these specifications.

3.5 FIRE-RATED CABLE AND ASSEMBLY INSTRUCTIONS

A. Terminations of the fire-rated cable must be outside of the fire zone.

B. Fire-rated cable shall be installed according to the manufacturer's instructions, recommendations, and UL listing.

C. Route fire-rated cable and assemblies separate from other feeders and distribution. Install cable and assemblies in locations protected from physical damage.

D. Refer to Electrical Identification Section 26 05 53 for specific identification requirements.

3.6 WIRING CONNECTIONS AND TERMINATIONS

A. Splice and tap only in accessible junction boxes.

B. Use solderless, tin-plated copper, compression terminals (lugs) applied with circumferential crimp for conductor terminations, 8 AWG and larger.

C. Use solderless, tin-plated, compression terminals (lugs) applied with indenter crimp for copper conductor terminations, 10 AWG and smaller.

D. Use solderless pressure connectors with insulating covers for copper wire splices and taps, 8 AWG and smaller. For 10 AWG and smaller, use insulated spring wire connectors with plastic caps.

E. Use compression connectors applied with circumferential crimp for conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor. Cold shrink connector insulator with 1kV rating shall be used in damp and wet locations.

F. Thoroughly clean wires before installing lugs and connectors.

G. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.

H. Phase Sequence: All apparatus shall be connected to operate in the phase sequence A-B-C representing the time sequence in which the phase conductors so identified reach positive maximum voltage.

I. As a general rule, applicable to switches, circuit breakers, starters, panelboards, switchgear and the like, the connections to phase conductors are intended thus:

1. Facing the front and operating side of the equipment, the phase identification shall be:

a. Left to Right - A-B-C
b. Top to Bottom - A-B-C

J. Connection revisions as required to achieve correct rotation of motors shall be made at the load terminals of the starters or disconnect switches.

K. Use antioxidant joint compound on all aluminum conductor terminations. Apply antioxidant joint compound per manufacturer's recommendations.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Equipment grounding system.

B. Bonding system.

C. Grounding electrode system.

1.2 REFERENCES

A. NFPA 70 - National Electrical Code (NEC).

B. CEC California Electrical Code.

C. NFPA 99 - Standard for Healthcare Facilities.

1.3 SUMMARY

A. This section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

PART 2 - PRODUCTS

2.1 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Division 26 Section 26 05 13 "Wire and Cable".

B. Material: Copper.

C. Equipment Grounding Conductors: Insulated. Refer to Section 26 05 53 for insulation color.

D. Grounding Electrode Conductors: Stranded cable.

E. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

F. GB; Grounding Bar:

1. Bare, annealed copper bars of rectangular cross section, with insulators. 1/4" x 2", length of technology or applicable room.

2.2 CONNECTOR PRODUCTS

A. Comply with UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

B. Bolted Connectors: Bolted-pressure-type connectors.

2.3 GROUNDING ELECTRODES

A. Ground Rods Copper-clad steel.

B. Ground Rods: Sectional type;[copper-clad steel][stainless steel].

1. Size: 3/4" in diameter by 120 inches per section.

PART 3 - EXECUTION

3.1 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

D. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

E. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically non-continuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

F. Structural Steel Connection: Exothermic-welded connections to structural steel. Coordinate with structure to provide physical protection.

G. Underground Connections: Exothermic-welded connections. Use for underground connections, except those at test wells.

H. Connections at Test Wells: Use compression-type connectors on conductors and make two bolted- and clamped-type connections between conductors and ground rods.

I. Connections at back boxes, junction boxes, pull boxes, and equipment terminations: The equipment grounding conductor(s) associated with all circuits in the box shall be connected together and to the box using a suitable grounding screw. The removal of the respective receptacle, luminaire, or other device served by the box shall not interrupt the grounding continuity. The connection to the non-metallic boxes shall be made to any metallic fitting or device requiring grounding.

J. Tighten screws and bolts for grounding and bonding 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.

K. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.2 INSTALLATION

A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.

B. Grounding electrode conductor (GEC) shall be protected from physical damage by rigid polyvinyl chloride conduit (PVC) in exposed locations.

C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then use a bolted clamp. Bond straps directly to the basic structure, taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

D. In raceways, use insulated equipment grounding conductors.

E. Underground Grounding Conductors: Use tinned copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches below grade or bury 12 inches above duct bank when installed as part of the duct bank.

F. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, below access floors, and elsewhere as indicated, with bolted connections to form a continuous ground path.

3.3 EQUIPMENT GROUNDING SYSTEM

A. Comply with Electrical Code, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by Electrical Code are indicated.

B. Install equipment grounding conductors in all feeders and circuits. Terminate each end on a grounding lug or bus.

C. Install insulated equipment grounding conductor with circuit conductors for the following items, in addition to those required by Electrical Code:

1. Lighting and receptacle circuits. Terminate each end on a grounding lug or bus.
2. Single-phase and three-phase motor and appliance branch circuits.
3. Flexible raceway runs, including FMC and LFMC.
4. Armored and metal-clad cable runs.

D. Busway Supply Circuits: Install insulated equipment grounding conductor from the grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

E. Computer Outlet Circuits: Install insulated equipment grounding conductor in branch-circuit runs from computer-area power panels or power-distribution units.

F. X-Ray Equipment Circuits: Install insulated equipment grounding conductor in circuits supplying x-ray equipment.

G. Isolated Grounding Circuits: Install an insulated equipment grounding conductor connected to the receptacle or equipment grounding terminal. Isolate grounding conductor from raceway and from panelboard grounding terminals. Terminate at isolated equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

H. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.

3.4 BONDING SYSTEM

A. At building expansion joints, provide flexible bonding jumpers to connect to columns or beams on each side of the expansion joint.

B. Isolated Equipment Enclosure: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install a separate equipment bonding conductor.

C. Exterior Metallic Pull and Junction Box Covers, Metallic Hand Rails: Bond to grounding system using flexible grounding conductors.

D. Connect bonding conductors to metal water pipe using a suitable ground clamp. Make connections to flanged piping at street side of flange. Provide bonding jumper around water meter.

E. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide No. 6 AWG minimum insulated bonding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location. Leave 10 feet of slack conductor at terminal board.

F. Industrial Control Panels, Terminal Cabinets, and Similar Installation: Terminate bonding conductor on cabinet grounding terminal. Provide an equipment grounding conductor and bond adjacent and associated control panels together.

G. Equipment Ground Conductor Continuity: All spliced equipment grounding conductors in junction boxes, cabinets, and distribution equipment shall be connected together and bonded to the metal enclosure.

H. Remote control, signaling, and fire alarm circuits shall be bonded in accordance with the most recent version of the National Electric Code.

3.5 GROUNDING ELECTRODE SYSTEM

A. Ground Ring (Counterpoise):

1. Ground the steel framework of the building with a driven ground rod at the base of every corner column and at intermediate exterior columns at average distances not more than 60 feet apart. Provide a grounding conductor, electrically connected to each ground rod and to each steel column, extending around the perimeter of the building. Use tinned-copper conductor not less than No. 2 AWG for ground ring and for tap to building steel. Bury conductor not less than 30 inches below grade, 24 inches from building foundation, and 18 inches outside of roof drip line.

B. Supplementary Grounding Electrode: Use driven ground rod on exterior of building.

C. Provide bonding at Utility Company's metering equipment and pad mounted transformer.

D. Metal Water Service Pipe: Provide 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 by grounding clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

E. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters, filtering devices, and similar equipment. Connect to pipe with grounding clamp connectors.

F. Natural Gas Service Piping: Bond to natural gas main service with grounding clamp connectors. Bonding conductor shall be connected to the main service ground bar. Provide grounding jumpers around all breaks in metallic continuity.

G. Natural Gas Equipment Piping: Bond each aboveground portion of natural gas metallic piping system at each equipment location with grounding clamp connectors. Bonding shall be performed after any flexible attachment nearest the equipment. The equipment grounding conductors may serve as the bonding means.

H. Install one test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade or floor.

3.6 CONCRETE OR WOOD BUILDING GROUNDING SYSTEM

A. Provide a copper common grounding electrode conductor for the attachment of multiple separately derived systems in accordance with Electrical Code. Individual grounding conductor taps from the separately derived systems to the common grounding electrode shall be sized in accordance with Electrical Code. All tap connections shall be made in an accessible location in such a manner that common grounding electrode conductor remains without a splice or joint.

3.7 EQUIPOTENTIAL (MULTI-POINT) GROUNDING SYSTEM

A. Provide an equipotential grounding system in the following locations:

1. Class I Div 1 and Div 2 locations as required in Electrical Code.
2. Swimming pool, fountains, and similar locations as required in Electrical Code.
3. Critical patient care and special care areas as indicated on drawings.

B. The non-current-carrying metal parts of equipment, raceways and other enclosures shall be bonded to the grounding system.

3.8 UNDERGROUND DISTRIBUTION SYSTEM GROUNDING

A. Manholes and Handholes: Install a driven ground rod close to wall and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide a No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, non-shrink grout.

B. Connections to Manhole Components: Connect 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 No. 4 AWG minimum, stranded, hard-drawn copper conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

C. Pad-Mounted Transformers and Switches: Install two ground rods and counterpoise circling pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Use tinned-copper conductor not less than No. 2 AWG for counterpoise and for taps to equipment ground pad. Bury counterpoise not less than 18 inches below grade and 6 inches from the foundation. The pad rebar shall be attached to the counterpoise conductor at the four corners.

3.9 GRADING AND PLANTING

A. Restore surface features, including vegetation, at areas disturbed by Work of this Section. Reestablish original grades, unless otherwise indicated. If sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include application of topsoil, fertilizer, lime, seed, sod, sprig, and mulch. Comply with Division 2. Maintain restored surfaces. Restore disturbed paving.

END OF SECTION

SECTION 26 05 33

CONDUIT AND BOXES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Rigid metallic conduit and fittings (RMC).

B. Electrical metallic tubing and fittings (EMT).

C. Liquid tight flexible metallic conduit and fittings (LFMC).

D. Rigid polyvinyl chloride conduit and fittings (PVC).

E. Pull and junction boxes.

F. Handholes.

G. Raceway Seals and Sealant.

1.2 RELATED WORK

A. Section 26 05 53 - Electrical Identification: Refer to electrical identification for color and identification labeling requirements.

1.3 REFERENCES

A. American National Standards Institute (ANSI):

1. ANSI C80.1 - Rigid Steel Conduit, Zinc-Coated
2. ANSI C80.3 - Electrical Metallic Tubing, Zinc-Coated and Fittings
3. ANSI C80.4 - Fittings for Rigid Metal Conduit and Electrical Metallic Tubing
4. ANSI C80.6 - Intermediate Metal Conduit, Zinc Coated
5. ANSI/NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers and Box Supports
6. ANSI/NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports

B. Federal Specifications (FS):

1. A-A-50553A - Fittings for Conduit, Metal, Rigid, (Thick-Wall and Thin-Wall (EMT) Type
2. A-A-55810 - Specification for Flexible Metal Conduit

C. NECA "Standards of Installation".

D. National Electrical Manufacturers Association (NEMA):

1. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable
2. RN 1 - Polyvinyl chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit, Rigid Aluminum Conduit, and Intermediate Metal Conduit
3. TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit
4. TC 9 - Fittings for PVC Plastic Utilities Duct for Underground Installation

E. NFPA 70 - National Electrical Code (NEC).

F. Underwriters Laboratories (UL): Applicable Listings

1. UL 1 - Flexible Metal Conduit
2. UL 6 - Rigid Metal Conduit
3. UL 360 - Liquid Tight Flexible Steel Conduit
4. UL514-B - Conduit Tubing and Cable Fittings
5. UL651-A - Type EB and a PVC Conduit and HDPE Conduit
6. UL651-B - Continuous Length HDPE Conduit
7. UL746A - Standard for Polymeric Materials - Short Term Property Evaluations
8. UL797 - Electrical Metal Tubing
9. UL1242 - Intermediate Metal Conduit

G. American Standard of Testing and Materials (ASTM):

1. ASTM D 570 - Standard Test Method for Water Absorption of Plastics
2. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics
3. ASTM D 648 - Standard Test Method for Deflection Temperature of Plastics under Flexural Load in the Edge Wise Position
4. ASTM D 2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
5. ASTM D 2447 - Standard Specification for Polyethylene (PE) Plastic Pipe, Schedules 40 and 80, Based on Outside Diameter
6. ASTM D 3350 - Standard Specification for Polyethylene Plastic Pipe and Fittings Material

H. Definitions:

1. Fittings: Conduit connection or coupling.
2. Body: Enlarged fittings with opening allowing access to the conductors for pulling purposes only.
3. Mechanical Spaces: Enclosed areas, usually kept separated from the general public, where the primary use is to house service equipment and to route services. These spaces generally have exposed structures, bare concrete and non-architecturally emphasized finishes.
4. Finished Spaces: Enclosed areas where the primary use is to house personnel and the general public. These spaces generally have architecturally emphasized finishes, ceilings and/or floors.

5. Concealed: Not visible by the general public. Often indicates a location either above the ceiling, in the walls, in or beneath the floor slab, in column coverings, or in the ceiling construction.
6. Above Grade: Not directly in contact with the earth. For example, an interior wall located at an elevation below the finished grade shall be considered above grade but a wall retaining earth shall be considered below grade.
7. Slab: Horizontal pour of concrete used for a floor or sub-floor.

PART 2 - PRODUCTS

2.1 RIGID METALLIC CONDUIT (RMC) AND FITTINGS

A. Manufacturers:

1. Allied
2. LTV
3. Steelduct
4. Calbond Calpipe
5. Wheatland Tube Co
6. O-Z Gedney
7. or approved equal.

B. Manufacturers of RMC Conduit Fittings:

1. Appleton Electric
2. O-Z/Gedney Co.
3. Electroline
4. Raco
5. Bridgeport
6. Midwest
7. Regal
8. Thomas & Betts
9. Crouse-Hinds
10. Killark
11. Orbit Industries
12. or approved equal.

C. Minimum Size Galvanized Steel: 3/4 inch, unless otherwise noted.

D. Fittings and Conduit Bodies:

1. End Bell Fittings: Malleable iron, hot dip galvanized, threaded flare type with provisions for mounting to form.
2. Expansion Joints: Malleable iron and hot dip galvanized providing a minimum of 4 inches of movement. Fitting shall be watertight with an insulating bushing and a bonding jumper.
3. Expansion Joint for Concrete Encased Conduit: Neoprene sleeve with bronze end coupling, stainless steel bands and tinned copper braid bonding jumper. Fittings shall be watertight and concrete-tight.
4. Conduit End Bushings: Malleable iron type with molded-on high impact phenolic thermosetting insulation. Where required elsewhere in the contract documents, bushing shall be complete with ground conductor saddle and clamp. High impact phenolic threaded type bushings are not acceptable.
5. All other fittings and conduit bodies shall be of malleable iron construction and hot dip galvanized.

2.2 ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS

A. Minimum Size Electrical Metallic Tubing: 3/4 inch, unless otherwise noted.

B. Manufacturers of EMT Conduit:

1. Allied
2. Calbond Calpipe
3. LTV
4. Steelduct
5. Wheatland Tube Co
6. or approved equal.

C. Fittings and Conduit Bodies:

1. 2" Diameter or Smaller: Compression type of steel designed for their specific application.
2. 3/4" Conduit: Push-on connectors and couplers with locking ring and washer of zinc plated steel, listed for use in dry locations.
3. Larger than 2": Compression type of steel designed for their specific application.
4. Set screw fittings shall not be used.
5. Manufacturers of EMT Conduit Fittings:

    a. Appleton Electric
    b. O-Z/Gedney Co.
    c. Electroline
    d. Raco
    e. Bridgeport
    f. Midwest
    g. Regal
    h. Thomas & Betts
    i. Orbit Industries
    j. or approved equal.

2.3 LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC) AND FITTINGS

A. Manufacturers:

1. Anaconda Type UA
2. Electri-Flex Type LA
3. Alflex
4. Carlon (Lamson & Sessions)
5. or approved equal.

B. Construction: Flexible steel, approved for conduit ground, zinc coated, threadless type formed from a continuous length of spirally wound, interlocked zinc coated strip steel and an extruded PVC cover.

C. Fittings and Conduit Bodies:

1. Watertight, compression type, galvanized zinc coated cadmium plated malleable cast iron, UL listed.
2. Fittings and conduit bodies shall include plastic or cast metal inserts supplied by the manufacturer to protect conductors from sharp edges.
3. Manufacturers:

    a. Appleton Electric
    b. O-Z/Gedney Co.
    c. Electroline
    d. Bridgeport
    e. Thomas & Betts
    f. Midwest
    g. Regal
    h. Carlon (Lamson & Sessions)
    i. Orbit Industries
    j. or approved equal.

2.4 RIGID NON-METALLIC CONDUIT (PVC) AND FITTINGS

A. Minimum Size Rigid Smooth-Wall Nonmetallic Conduit: 3/4 inch, unless otherwise noted.

B. Acceptable Manufacturers:

1. Carlon (Lamson & Sessions) Type 40
2. Cantex, J.M. Mfg.
3. or approved equal.

C. Construction: Schedule 40 and Schedule 80 rigid polyvinyl chloride (PVC), UL labeled for 90°C.

D. Fittings and Conduit Bodies: NEMA TC 3; sleeve type suitable for and manufactured especially for use with the conduit by the conduit manufacturer.

E. Plastic cement for joining conduit and fittings shall be provided as recommended by the manufacturer.

2.5 OUTLET BOXES

A. Sheet Metal Outlet Boxes: ANSI/NEMA OS 1; galvanized steel, 16 gauge (approximately 0.0625 inches), with 1/2-inch male fixture studs where required.

B. Nonmetallic Outlet Boxes: ANSI/NEMA OS 2.

C. Cast Boxes: Nema FB1, Type FD, Aluminum, cast feralloy, or stainless steel deep type, gasketed cover, threaded hubs.

D. Outlet boxes for luminaires to be not less than 1-1/2" deep, deeper if required by the number of wires or construction. The box shall be coordinated with surface luminaires to conceal the box from view or provide a finished trim plate.

E. Switch outlet boxes for local light control switches, dimmers and occupancy sensors shall be 4 inches square by 2-1/8 inches deep, with raised cover to fit flush with finish wall line. Multiple gang switch outlets shall consist of the required number of gang boxes appropriate to the quantity of switches comprising the gang. Where walls are plastered, provide a plaster raised cover. Where switch outlet boxes occur in exposed concrete block walls, boxes shall be installed in the block cavity with a raised square edge tile cover of sufficient depth to extend out to face of block or masonry boxes.

F. Outlet boxes for telephone substations in walls and columns shall be 4 inches square and 2-1/8 inches deep with single gang raised cover to fit flush with finished wall line equipped with flush telephone plate.

G. Wall or column receptacle outlet boxes shall be 4 inches square with raised cover to fit flush with finished wall line. Boxes in concrete block walls shall be installed the same as for switch boxes in block walls.

2.6 PULL AND JUNCTION BOXES

A. Sheet Metal Boxes: ANSI/NEMA OS 1; galvanized steel.

B. Sheet metal boxes larger than 12 inches in any dimension that contain terminations or components: Continuous hinged enclosure with 1/4 turn latch and white back panel for mounting terminal blocks and electrical components.

C. Cast Metal Boxes for Outdoor and Wet Location Installations: NEMA 250; Type 4 and Type 6, flat-flanged, surface-mounted junction box, UL listed as raintight. Galvanized cast iron box and cover with ground flange, neoprene gasket, and stainless steel cover screws.

D. Cast Metal Boxes for Underground Installations: NEMA 250; Type 4, inside flanged, recessed cover box for flush mounting, UL listed as raintight. Galvanized cast iron box and plain cover with neoprene gasket and stainless steel cover screws.

E. Flanged type boxes shall be used where installed flush in wall.

2.7 HANDHOLES

A. Handhole, composite polymer concrete body and cover. Stainless steel hardware. Bolted non-skid cover rated for 10,000 pounds. Design load occasional non-deliberate vehicular traffic. Stack units to achieve depth shown on plans. Units in landscaped areas shall be green in color. [11"W, 18"L, 18"D or dimensions as shown on plans.]

1. Manufacturers:

a. Hubbell/Quazite
b. Carson Industries H Series
c. Armorcast
d. Highline Products
e. Synertech

2.8 FOUNDATION - UNDERGROUND SLEEVES AND SEALS

A. Wall Seals ("Link-Seals"):

1. Where shown on the drawings, raceways passing through foundation walls to an underground condition shall have their annual space (sleeve or drilled hole - not tapered hole made with knockout plug) sealed by properly sized sealing element consisting of a synthetic rubber material compounded to resist aging, ozone, sunlight, water and chemical action.
2. Sleeves, if used, shall be standard weight steel with primed finish and waterstop/anchor continuously welded to sleeve.
3. Sleeves shall be at least 2 trade sizes larger than the penetrating raceway.
4. Pressure shall be maintained by stainless steel bolts and accessories. Pressure plates may be of composite materials for Models S and OS.
5. Sealing Elements shall be as follows:

Model	Service	Element Material	Temperature Range
S	Standard (Stainless)	EPDM	-40°F to 250°F
T	Fire Seals (1 hour)	Silicone	-67°F to 400°F
FS	Fire Seals (3 hours)	Silicone	-67°F to 400°F
OS	Oil Resistant / Stainless	Nitrile	-40°F to 210°F

6. Approved Manufacturers:

a. Thunderline Corporation "Link-Seals"
b. O-Z/Gedney Company
c. Calpico, Inc
d. Innerlynx
e. Polywater PGKD Series

PART 3 - EXECUTION

3.1 CONDUIT INSTALLATION SCHEDULE AND SIZING

A. In the event the location of conduit installation represents conflicting installation requirements as specified in the following schedule, a clarification shall be obtained from the Architect/Engineer. If this Contractor is unable to obtain a clarification as outlined above, concealed rigid galvanized steel conduit installed per these specifications and the Electrical Code shall be required.

B. Installation Schedule: Refer to drawings.

C. Size conduit as shown on the drawings and specifications. Where not indicated in the contract documents, conduit size shall be according to the Electrical Code. Conduit and conductor sizing shall be coordinated to limit conductor fill to less than 40%, maintain conductor ampere capacity as required by the Electrical Code (to include enlarged conductors due to temperature and quantity derating values) and to prevent excessive voltage drop and pulling tension due to long conduit/conductor lengths.

D. Minimum Conduit Size (Unless Noted Otherwise): 3/4 inch.

E. Conduit sizes shall change only at the entrance or exit to a junction box, unless specifically noted on the drawings.

3.2 CONDUIT ARRANGEMENT

A. In general, conduit shall be installed concealed in walls, in finished spaces and where possible or practical, or as noted otherwise. Conduit shall be installed parallel or perpendicular to walls, ceilings, and exposed structural members. In unfinished spaces, mechanical and utility areas, conduit may run either concealed or exposed as conditions dictate and as practical unless noted otherwise on drawings. Installation shall maintain headroom in exposed vicinities of pedestrian or vehicular traffic.

B. Exposed conduit on exterior walls or above roof will not be allowed without prior written approval of Architect/Engineer. A drawing of the proposed routing and a photo of the location shall be submitted 14 days prior to start of conduit rough-in. Routing shall be shown on coordination drawings.

C. Conduit arrangement in elevated slabs (restricted to applications specifically noted or shown on drawings):

1. Conduit size shall not exceed one-third of the structural slab thickness. Place conduit between the top and bottom reinforcing with a minimum of 3" concrete cover.
2. Parallel conduits shall be spaced at least 8 inches apart. Exception: Within 18 inches of commonly served floor boxes, junction boxes, or similar floor devices. Arrange conduits parallel or perpendicular to building lines and walls.

D. Conduit shall not share the same cell as structural reinforcement in masonry walls.

E. Conduit runs shall be routed as shown on large scale drawings. Conduit routing on drawings scaled 1/4"=1'-0" or less shall be considered diagrammatic, unless noted otherwise. The correct routing, when shown diagrammatically shall be chosen by the Contractor based on information in the contract documents, in accordance with manufacturer's written instructions, applicable codes, the NECA's "Standard of Installation", in accordance with recognized industry standards, and coordinated with other contractors.

F. Contractor shall adapt Contractor's work to the job conditions and make such changes as required and permitted by the Architect/Engineer, such as moving to clear beams and joists, adjusting at columns, avoiding interference with windows, etc., to permit the proper installation of other mechanical and/or electrical equipment.

G. Contractor shall cooperate with all contractors on the project. Contractor shall obtain details of other contractor's work to ensure fit and avoid conflict. Any expense due to the failure of This Contractor to do so shall be paid for in full by Contractor. The other trades involved as directed by the Architect/Engineer shall perform the repair of work damaged as a result of neglect or error by This Contractor. The resultant costs shall be borne by This Contractor.

3.3 CONDUIT SUPPORT

A. Conduit runs installed above a suspended ceiling shall be properly supported. In no case shall conduit rest on the suspended ceiling construction, nor utilize ceiling support system for conduit support.

1. Support wire used to independently support raceway and wiring systems above suspending ceilings shall be supported on both ends, minimum 12 gauge suspended ceiling support wire, and distinguishable from ceiling support systems by color (field paint), tagging, or equivalent means.

B. Conduit shall not be supported from ductwork, water, sprinkler piping, or other non-structural members, unless approved by the Architect/Engineer. All supports shall be from structural slabs, walls, structural members, and bar joists, and coordinated with all other applicable contractors, unless noted otherwise.

C. Conduit shall be held in place by the correct size of galvanized one-hole conduit clamps, two-hole conduit straps, patented support devices, clamp back conduit hangers, or by other means if called for on the drawings.

D. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

E. Spring-steel conduit clips specifically designed for supporting single conduits or tubing may be used in lieu of malleable-iron hangers for [**1-1/2"**][**1"**] and smaller raceways serving lighting and receptacle branch circuits above accessible ceilings and for securing raceways to slotted channel and angle supports.

F. Group conduits in parallel runs where practical and use conduit racks or trapeze hangers constructed of steel channel, suspended with threaded solid rods or wall mounted from metal channels with conduit straps or clamps. Provide space in each rack or trapeze for 25% additional conduits.

G. Do not exceed 25 lbs. per hanger and a minimum spacing of 2'-0" on center when attaching to metal roof decking (excludes concrete on metal deck). This 25 lbs. load and 2'-0" spacing include adjacent electrical and mechanical items hanging from deck. If the hanger restrictions cannot be achieved, supplemental framing off steel framing will need to be added.

H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

I. Supports for metallic conduit shall be no greater than 10 feet. A smaller interval may be used if necessitated by building construction, but in no event shall support spans exceed the Electrical Code requirements. Conduit shall be securely fastened within 3 feet of each outlet box, junction box, device box, cabinet, or fitting.

J. Supports of flexible conduit shall be within 12 inches of each outlet box, junction box, device box, cabinet, or fitting and at intervals not to exceed 4.5 feet.

K. Supports for non-metallic conduit shall be at sufficiently close intervals to eliminate any sag in the conduit. The manufacturer's recommendations shall be followed, but in no event shall support spans exceed the Electrical Code requirements.

L. Where conduit is to be installed in poured concrete floors or walls, provide concrete-tight conduit inserts securely fastened to forms to prevent conduit misplacement.

M. Finish:

1. Prime coat exposed steel hangers and supports. Hangers and supports in crawl spaces, pipe shafts, and above suspended ceiling spaces are not considered exposed.
2. Trim all ends of exposed field fabricated steel hangers, slotted channel and threaded rod to within 1" of support or fastener to eliminate potential injury to personnel unless shown otherwise on the drawings. Smooth ends and install elastomeric insulation with two coats of latex paint if exposed steel is within 6'-6" of finish floor and presents potential injury to personnel.

3.4 CONDUIT INSTALLATION

A. Conduit Connections:

1. Shorter than standard conduit lengths shall be cut square using industry standards. The ends of all conduits cut shall be reamed or otherwise finished to remove all rough edges.
2. Metallic conduit connections in slab on grade installation shall be sealed and one coat of rust inhibitor primer applied after the connection is made.
3. Where conduits with tapered threads cannot be coupled with standard couplings, then approved split or Erickson couplings shall be used. Running threads will not be permitted.
4. Install expansion/deflection joints where conduit crosses structure expansion/seismic joints.

B. Conduit terminations for all low voltage wiring shall have nylon bushings installed on each end of every conduit run.

C. Conduit Bends:

1. Use a hydraulic one-shot conduit bender or factory elbows for bends in conduit 2" in size or larger. All steel conduit bending shall be done cold; no heating of steel conduit shall be permitted.
2. A run of conduit shall not contain more than the equivalent of four (4) quarter bends (360°), including those bends located immediately at the outlet or body.
3. Telecommunications conduits shall have no more than two (2) 90-degree bends between pull points and contain no continuous sections longer than 100 feet. Insert pull points or pull boxes for conduits exceeding 100 feet in length.

    a. A third bend is acceptable if:

        1) The total run is no longer than (33) feet.
        2) The conduit size is increased to the next trade size.

4. Telecommunications pull boxes shall not be used in lieu of a bend. Align conduits that enter the pull box from opposite ends with each other. Pull box size shall be twelve (12) times the diameter of the largest conduit. Slip sleeves or gutters can be used in place of a pull box.
5. Telecommunications Conduit(s): Maintain appropriate conduit bend radius at all times. For conduits with an internal diameter of less than 2", maintain a bend radius of at least 6 times the internal diameter. For conduits with an internal diameter 2" or greater, maintain a bend radius of at least 10 times the internal diameter.
6. Rigid polyvinyl chloride conduit (PVC) runs longer than 100 feet or runs which have more than two 90° equivalent bends (regardless of length) shall use rigid metal or RTRC factory elbows for bends.
7. Use conduit bodies to make sharp changes in direction (i.e., around beams).

D. Conduit Placement:

1. Conduit shall be mechanically continuous from source of current to all outlets. Conduit shall be electrically continuous from source of current to all outlets, unless a properly sized grounding conductor is routed within the conduit. All metallic conduits shall be bonded per the Electrical Code.
2. Route exposed conduit and conduit above suspended ceilings (accessible or not) parallel/perpendicular to the building structural lines, and as close to building structure as possible. Wherever possible, route horizontal conduit runs above water and steam piping.
3. Route conduit through roof openings provided for piping and ductwork where possible. If not provided or routing through provided openings is not possible, route through roof jack with pitch pocket. Coordinate roof penetrations with other trades.
4. Conduits, raceway, and boxes shall not be installed in concealed locations in metal deck roofing or less than 1.5" below bottom of roof decking.
5. Avoid moisture traps where possible. Where unavoidable, provide a junction box with drain fitting at conduit low point.

6. All conduits through walls shall be grouted or sealed into openings. Where conduit penetrates firewalls and floors, seal with a UL listed sealant. Seal penetrations with intumescent caulk, putty, or sheet installed per manufacturer's recommendations. All materials used to seal penetrations of firewalls and floors shall be tested and certified as a system per ASTM E814 Standard for fire tests or through-penetration fire stops as manufactured by 3M or approved equal.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN MASONRY OR EXTERIOR WALLS UNDER THIS DIVISION. A QUALIFIED MASON AT THE EXPENSE OF THIS CONTRACTOR SHALL REPAIR ALL OPENINGS TO MATCH EXISTING CONDITIONS.
8. Seal interior of conduit at exterior entries, air handling units, coolers/freezers, etc., and where the temperature differential can potentially be greater than 20°F, to prevent moisture penetration. Seal shall be placed where conduit enters warm space. Conduit seal fitting shall be a drain/seal, with sealing compound, identified for use with cable and raceway system.
9. Horizontal conduit routing through slabs above grade

    a. Conduits, if run in concrete structure, shall be in middle one-third of slab thickness, and leave at least 3" min. concrete cover. Conduits shall run parallel to each other and spaced at least 8" apart centerline to centerline. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement. Maximum conduit outside diameter 1".
    b. No conduits are allowed in concrete on metal deck unless expressly approved in writing by the Structural Engineer.
    c. No conduits are allowed to be routed horizontally through slabs above grade.

10. Do not route conduits across each other in slabs on grade.
11. Contractor shall provide suitable mechanical protection around all conduits stubbed out from floors, walls or ceilings during construction to prevent bending or damaging of stubs due to carelessness with construction equipment.
12. Contractor shall provide a polypropylene pull cord with 2000 lbs. tensile strength in each empty conduit (indoor and outdoor), except in sleeves and nipples.

3.5 CONDUIT TERMINATIONS

A. Where conduit bonding is indicated or required in the contract documents, the bushings shall be a grounding type sized for the conduit and ground bonding conductor as manufactured by O-Z/Gedney, Appleton, Thomas & Betts, Burndy, Regal, Orbit Industries or approved equal.

B. Conduits with termination fittings shall be threaded for one (1) lock nut on the outside and one (1) lock nut and bushing on the inside of each box.

C. Where conduits terminate in boxes with knockouts, they shall be secured to the boxes with lock nuts and provided with approved screw type tinned iron bushings or fittings with plastic inserts.

D. Where conduits terminate in boxes, fittings, or bodies with threaded openings, they shall be tightly screwed against the shoulder portion of the threaded openings.

E. All conduit ends shall be sealed with plastic immediately after installation to prevent the entrance of any foreign matter during construction. The seals shall be removed and the conduits blown clear of all foreign matter prior to any wires or pull cords being installed.

3.6 UNDERGROUND CONDUIT INSTALLATION

A. Conduit Connections:

1. Conduit joints in a multiple conduit run shall be staggered at least one foot apart.

B. Conduit Bends (Lateral):

1. Conduits shall have long sweep radius elbows instead of standard elbows wherever special bends are indicated and noted on the drawings, or as required by the manufacturer of the equipment or system being served.
2. Telecommunications conduit bend radius shall be six times the diameter for conduits under 2" and ten times the diameter for conduits over 2". Where long cable runs are involved, sidewall pressures may require larger radius bends. Coordinate with Architect/Engineer prior to conduit installation to determine bend radius.

C. Conduit Elbows (vertical):

1. Minimum metal or RTRC elbow radiuses shall be 30 inches for primary conduits (greater than 600V) and 18 inches for secondary conduits (less than 600V). Increase radius, as required, based on pulling tension calculation requirements.

D. Expansion Fittings at Finished Grade: Provide underground raceways with an expansion fitting after emerging from finished grade and exterior equipment pads. Field locate the expansion fitting above and within 24 inches of finished grade. Raceways extending less than 12 inches above finished grade, transitioning to LFMC within 12 inches of finished grade, and interior concrete building slabs do not require an expansion fitting unless required by code.

E. Conduit Placement:

1. Conduit runs shall be pitched a minimum of 4" per 100 feet to drain toward the terminations. Duct runs shall be installed deeper than the minimum wherever required to avoid any conflicts with existing or new piping, tunnels, etc.
2. For parallel runs, use suitable separators and chairs installed not greater than 4' on centers. Band conduit together with suitable banding devices. Securely anchor conduit to prevent movement during concrete placement or backfilling.
3. Where concrete is required, the materials for concreting shall be thoroughly mixed to a minimum f'c = 2500 and immediately placed in the trench around the conduits. No concrete that has been allowed to partially set shall be used.
4. Before the Contractor pulls any cables into the conduit, Contractor shall have a mandrel 1/4" smaller than the conduit inside diameter pulled through each conduit and if any concrete or obstructions are found, the Contractor shall remove them and clear the conduit. Spare conduit shall also be cleared of all obstructions.
5. Conduit terminations in manholes, masonry pull boxes, or masonry walls shall be with malleable iron end bell fittings.

6. All spare conduits not terminated in a covered enclosure shall have its terminations plugged as described above.
7. Ductbanks and conduit shall be installed a minimum of 24" below finished grade, unless otherwise noted on the drawings or elsewhere in these specifications.
8. All non-metallic conduit installed underground outside of a slab shall be rigid.

F. Horizontal Directional Drilling:

1. Entire drill path shall be accurately surveyed, with entry and exit stakes placed and coordinated with other contractors. If using a magnetic guidance system, entire drill path shall be surveyed for any surface geo-magnetic variations or anomalies.
2. Any utility locates within 20 feet of the bore path shall have the exact location physically verified by hand digging or vacuum excavation. Restore inspection holes to original condition after verification.

G. Raceway Seal (Exterior to Raceway):

1. All power, telecommunication, electrical conduits and innerducts shall be sealed between the raceway and the building foundation. The raceway penetration shall be sealed liquid-tight, water-tight, non-corrosive.

2. Below Grade Installation Options:

   a. Cast-in-place concrete installation.
   b. Hydraulic cement, hydraulic group, hydraulic epoxy.
   c. Foundation - Underground Sleeves and Seals; refer to Part 2-Products for product information.

3. Above Grade Installation Options:

   a. Masonry grout for masonry applications.
   b. Caulk Sealant, interior/exterior rated, color per architect. Approved Manufacturers include Sachco, Tremco Vulkem, Sika or approved equal when not specified by architectural scope.

H. Raceway Seal (Interior to Raceway, with Cables or Empty):

1. All power, telecommunication, electrical conduits and innerducts, including those with cables, shall be sealed at the building and vault entry. The seal shall prevent the entry of liquids or gases. Seal must be compatible with conductors and raceway system. Spare or unused raceways shall also be sealed.

2. Installation Schedule, nominal size:

   a. 2" or less: Duct Seal Bushing or Duct Sealnt
   b. 2-1/2" through 4": Duct Seal Bushing
   c. 5" and 6": Wall Sleeve Duct Seal System

3.7 COORDINATION OF BOX LOCATIONS

A. Provide electrical boxes as shown on the drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance.

B. Electrical box locations shown on the Contract Drawings are approximate, unless dimensioned. Verify location of floor boxes and outlets in offices and work areas prior to rough-in.

C. Locate and install boxes to allow access. Avoid interferences with ductwork, piping, structure, equipment, etc. Recessed luminaires shall not be used as access to outlet, pull, and junction boxes. Where installation is inaccessible, provide access doors. Coordinate locations and sizes of required access doors with the Architect/Engineer and General Contractor.

D. Locate and install to maintain headroom and to present a neat appearance.

E. Coordinate locations with Heating Contractor to avoid baseboard radiation cabinets.

3.8 EXPOSED BOX INSTALLATION

A. Boxes shall be secured to the building structure with proper size screws, bolts, hanger rods, or structural steel elements.

B. On brick, block and concrete walls or ceilings, exposed boxes shall be supported with no less than two (2) Ackerman-Johnson, Paine, Phillips, or approved equal screw anchors or expansion shields and round head machine screws. Cast boxes shall not be drilled.

C. On steel structures, exposed boxes shall be supported to the steel member by drilling and tapping the member and fastening the boxes by means of round head machine screws.

D. Boxes may be supported on steel members by APPROVED beam clamps if conduit is supported by beam clamps.

E. Boxes shall be fastened to wood structures by means of a minimum of two (2) wood screws adequately large and long to properly support. (Quantity depends on size of box.)

F. Wood, plastic, or fiber plugs shall not be used for fastenings.

G. Explosive devices shall not be used unless specifically allowed.

END OF SECTION

SECTION 26 05 53

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Adhesive Markings and Field Labels.

B. Nameplates and Signs.

C. Product Colors.

1.2 REFERENCES

A. NFPA 70E - National Electrical Safety Code.

B. NFPA 70 - National Electrical Code (NEC).

C. ANSI A13.1 - Standard for Pipe Identification.

D. ANSI Z535.4 - Standard for Product Safety Signs and Labels.

PART 2 - PRODUCTS

2.1 ADHESIVE MARKINGS AND FIELD LABELS

A. Adhesive Marking Labels for Raceway: Pre-printed, flexible, self-adhesive vinyl labels with legend indicating voltage and service (Emergency, Lighting, Power, HVAC, Communications, Control, Fire).

B. Underground Plastic Markers: Bright colored continuously printed plastic ribbon tape of not less than 6 inches wide by 4 mil thick, printed legend indicating type of underground line, manufactured for direct burial service. Tape shall contain a continuous metallic wire to allow location with a metal detector.

C. Indoor/Outdoor Number and Letters: Outdoor grade vinyl label with acrylic adhesive designed for permanent application in severe indoor and outdoor environments.

2.2 NAMEPLATES AND SIGNS

A. Engraved, Plastic-Laminated Labels, Signs and Instruction Plates: Engraving stock melamine plastic laminate, 1/16-inch minimum thick for signs up to 20 square inches, or 8 inches in length; 1/8 inch thick for larger sizes. Labels shall be punched for mechanical fasteners.

B. Text Sizes:

1. The following information shall be used for text heights, fonts, and size, unless otherwise noted.

a. Text Height: 3/8 inch minimum

C. Baked-Enamel Signs for interior Use: Preprinted aluminum signs, punched, or drilled for fasteners, with colors, legend, and size required for application. Mounting ¼¼" grommets in corners.

D. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396 inch galvanized-steel backing: and with colors, legend, and size required for application. Mounting 1/4" grommets in corners.

E. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.

F. Fasteners for Plastic-Laminated Signs; Self-tapping stainless steel screws or number 10/32 stainless steel machine screws with nuts and flat and lock washers.

2.3 PRODUCT COLORS

A. Adhesive Markings and Field Labels:

1. Normal Power and General Labels: Black letters on white face
2. Control Labels: Black letters on white face
3. Medium Voltage (greater than 1,000 volts): Black letters on white face
4. Fire Alarm: Red letters on white face
5. Emergency: Red letters on white face

B. Nameplates and Signs:

1. NORMAL POWER: Black letters on white face
2. Control Labels: Black letters on white face
3. EMERGENCY: White letters on red face
4. GROUNDING: White letters on green face.
5. CAUTION or UPS: Black letters on yellow face

C. Raceways and Conduit:

1. Provide color coded conduit as indicated below. Conduit shall be colored by the manufacturer:

    a. Normal Power and General Distribution: Silver
    b. Emergency Power Distribution System:

        1) All Emergency: Orange
        2) Legally Required Standby: Yellow
        3) Optional Standby: Orange
        4) Life Safety and Critical Branch: Yellow
        5) Equipment Branch: Orange

    c. Fire Alarm System: Red
    d. Ground: Green

D. Box Covers:

1. Box covers shall be painted to correspond with system type as follows:

    a. Normal Power and General: Silver
    b. Emergency Power and Distribution:

        1) All Emergency: Orange
        2) Legally Required Standby: Yellow
        3) Optional Standby: Orange
        4) Life Safety and Critical Branch: Yellow
        5) Equipment Branch: Orange

    c. Fire Alarm System: Red
    d. Temperature Controls: Refer to mechanical cover sheet for color
    e. Ground: Green
    f. Low Voltage and Telephone: Purple
    g. Clock, Sound, Security System, and Intercom: Black
    h. Nurse Call: White

2. Box cover colors shall match conduit colors listed above.

E. Conductor Color Identification: Refer to Part 3 for additional information.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Lettering and Graphics: Coordinate names, abbreviations, colors, and other designations used in electrical identification work with corresponding designations specified or indicated. Install numbers, lettering, and colors as required by code.

B. Exposed Ceilings and Finished Spaces: The project includes exposed ceilings in finished spaces. The installation of colored raceways and labeling may not be aesthetically desirable in finished spaces. The contractor shall coordinate identification requirements in exposed ceilings of finished spaces with the Architect/Engineer prior to installation and ordering of materials.

C. Electrical System Color Chart: This Contractor shall furnish and install framed 8" x 12" charts of the color-coded identification scheme used for the electrical system in all electrical rooms and next to the main fire alarm panel.

D. Install identification devices in accordance with manufacturer's written instruction and requirements of Electrical Code.

E. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work. All mounting surfaces shall be cleaned and degreased prior to identification installation.

F. Circuit Identification: Tag or label conductors as follows:

1. Multiple Power or Lighting Circuits in Same Enclosure: Where multiple branch circuits are terminated or spliced in a box or enclosure, label each conductor with source and circuit number.
2. Multiple Control Wiring and Communication/Signal Circuits in Same Enclosure: For control and communications/signal wiring, use wire/cable marking tape at terminations in wiring boxes, troughs, and control cabinets. Use consistent letter/number conductor designations throughout on wire/cable marking tape.
3. Match identification markings with designations used in panelboards shop drawings, Contract Documents, and similar previously established identification schemes for the facility's electrical installations.

G. Apply Danger, Warning, Caution and instruction signs as follows:

1. Install Danger, Warning, Caution or instruction signs where required by Electrical Code, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems and of the items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions or explanations are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
2. 'Danger' indicates a hazardous situation which, if not avoided, will result in death or serious injury. ANSI standard red background, white letters.
3. 'Warning' indicates a hazardous situation which, if not avoided, could result in death or serious injury. ANSI standard orange background, black letters.

4. 'Caution' indicates a hazardous situation which, if not avoided, may result in minor or moderate injury. ANSI standard yellow background, black letters.

H. Apply circuit/control/item designation labels of engraved plastic laminate for pushbuttons, pilot lights, alarm/signal components, and similar items, except where labeling is specified elsewhere.

I. Install labels parallel to equipment lines at locations as required and at locations for best convenience of viewing without interference with operation and maintenance of equipment.

J. Install ARC FLASH WARNING signs on all switchboards, switchgear, distribution panels, branch panelboards, industrial control panels, and motor control centers.

1. Sample Label:
   ! WARNING
   ARC FLASH AND SHOCK HAZARD
   APPROPRIATE PPE REQUIRED
   FAILURE TO COMPLY CAN RESULT IN DEATH OR INJURY
   REFER TO NFPA 70E

K. Circuits with more than 600V: Identify raceway and cable with "DANGER-HIGH VOLTAGE" in black letters 2 (50mm) inches high on orange background at 10'-0 foot intervals.

1. Entire floor area directly above conduits running beneath and within 12 inches of a basement or ground floor that is in contact with earth or is framed above unexcavated space.
2. Wall surfaces directly external to conduits concealed within wall.
3. All accessible surfaces of concrete envelope around conduits in vertical shafts, exposed in building, or concealed above suspended ceilings.

L. Selective Coordination Label: Install caution signs on all switchboards, distribution panels, panelboards, disconnects, and other equipment with selectively coordinated overcurrent protection devices. Sign at a minimum shall contain:

1. CAUTION: OVERCURRENT DEVICES IN THIS ENCLOSURE ARE SELECTIVELY COORDINATED. EQUIVALENT REPLACEMENTS AND TRIP SETTINGS ARE REQUIRED.

M. Underground Electrical Lines: For exterior underground power, control, signal, and communication lines, install continuous underground plastic line marker located directly above line at 6 (150mm) to 8 (205mm) inches below grade. A single plastic line marker is permitted when the width of the common trench does not exceed 16 inches; provide a second plastic line marker to mark each edge of the trench when 16 inches of width is exceeded. Install line marker for underground wiring, both direct-buried cables and cables in raceway.

3.2 FEEDER AND BRANCH CIRCUIT DIRECTORIES

A. Feeder Directories Branch: Provide each feeder, branch circuit, feeder modification, and branch circuit modification with a typed circuit directory label. Refer to technical equipment specification sections for additional requirements. Include the following with each label:

1. Load Description: Lighting, receptacles, specific equipment, spare, space, or similar description.
2. Location: Room name, number, location.

B. Provide a factory or custom clear plastic sleeve for each branch panel directory and secure to inside panel cover. [Three ring binders with individual circuit directories for each applicable branch panel may be substituted when AHJ approved, all branch panels are within the same room and within sight of the binder, and the binder is supplied with three printed copies of each directory, an electronic editable copy of the directors is saved to USB within the binder, and the binder is permanently secured an adjacent wall with a chain or metal cable with adequate length to reference the binder within the working clearance space of each applicable panel. Provide a wall mounted drop-in office bin to store the binder.]

3.3 BOX LABELING

A. Identify Junction, Pull and Connection Boxes: Labeling shall be 3/8-inch Kroy tape OR Brother self-laminating vinyl label, letters/numbers color coded same as conduits.

B. All junction, pull, and connection boxes shall be identified as follows:

1. For power and lighting circuits, indicate system voltage and identity of contained circuits ("120V, 1LA1-3,5,7").
2. Essential Electrical System EES: When applicable the label shall include "Essential Electrical System EES". Maximum interval between label intervals shall be 25 feet or as required by code.
3. For other wiring, indicate system type and description of wiring ("FIRE ALARM NAC #1").

3.4 CONDUCTOR COLOR CODING

A. Products:

1. All wire and cables shall be color coded by the manufacturer.
2. All wires and cables, 6 AWG or larger, used in motor circuits, main feeders, sub-main feeders, and branch circuits shall be coded by the application of plastic tape. The tape shall be 3-M, Plymouth or Permacel in colors specified below. The tape shall be applied at each conductor termination with two 1-inch tape bands at 6-inch centers. Contractor option to use colored cabling in lieu of the tape at each end for conductor 6 AWG to 500 KCM.

B. Where more than one nominal voltage system exists in a building or facility, each ungrounded conductor of a multi-wire branch circuit, where accessible, shall be identified by phase and system.

C. Conductors shall be color coded as follows:

1. 120/240 Volt, 3-Wire:

   a. A-Phase - Black
   b. B-Phase - Red
   c. Neutral - White
   d. Ground Bond - Green

2. 208Y/120 Volt, 4-Wire:

   a. A-Phase - Black
   b. B-Phase - Red
   c. C-Phase - Blue
   d. Neutral - White
   e. Ground Bond - Green

3. 480Y/277 Volt, 4-Wire:

   a. A-Phase - Brown
   b. B-Phase - Orange
   c. C-Phase - Yellow
   d. Neutral - Gray
   e. Ground Bond - Green

4. 120 Volt, 2-Wire Isolated (Ungrounded) Power System:

   a. A-Phase - Orange with distinctive colored stripe other than white, green or gray along the entire length of the conductor
   b. B-Phase - Brown with distinctive colored stripe other than white, green or gray along the entire length of the conductor
   c. Ground Reference - Green

5. 120/208 Volt, 3-Wire, Isolated (Ungrounded) Power System:

   a. A-Phase - Orange with distinctive colored stripe other than white, green or gray along the entire length of the conductor
   b. B-Phase - Brown with distinctive colored stripe other than white, green or gray along the entire length of the conductor
   c. C-Phase - Yellow with distinctive colored stripe other than white, green or gray along the entire length of the conductor
   d. Ground Reference - Green

6. Cabling for Remote Control, Signal, and Power Limited Circuits:

   a. Low Voltage Switching: Per manufacturer recommendations and code requirements.
   b. Building Automation Systems and Control: Refer to the Temperature Control Contactor notes located on the mechanical cover sheet.

c. Electronic Control: Per manufacturer recommendations and code requirements.

3.5 POWER DISTRIBUTION EQUIPMENT IDENTIFICATION

A. Provide identification on the front of all power distribution equipment such as panelboards, switchboards, switchgear, motor control centers, generators, UPS, storage battery disconnects, transfer switches, etc. Labels shall be visible on the exterior of the gear, correspond to the one-line diagram nomenclature, and identify each cubicle of multi-section gear.

1. Interior Equipment: The identification material shall be engraved plastic-laminated labels.
2. Exterior Equipment: The identification material shall be engraved vinyl labels.
3. Labeling shall include:

   a. Essential Electrical System EES: When applicable the label shall include "Essential Electrical System EES". Applicable equipment includes components of the life safety and critical branch for healthcare facilities (generators, transfer switches, switchboards, distribution panels, panelboards, etc.).
   b. Equipment type and contract documents designation of equipment.
   c. Voltage of the equipment.
   d. Name of the upstream equipment and location of the upstream equipment if it is not located within sight.
   e. Rating and type of the overcurrent protection device serving the equipment if it is not located within sight ("FED BY 400A/3P BREAKER").
   f. Sample Label:

      DISTRIBUTION PANEL DP-H1
      480Y/277V
      FED FROM SWITCHBOARD "SB-1" (LOCATED IN MAIN ELEC ROOM)

4. Provide the following on a separate label, installed below the label above:

   a. Available fault current; refer to one-line diagram or panel schedules
   b. Date of fault current study; refer to one-line diagram
   c. Sample Label:

      22,000 AMPS AVAILABLE FAULT CURRENT
      DATE OF STUDY: 1 JAN 2017

B. Service Equipment Label: A separate nameplate for the service entrance equipment and include:

1. Nominal system voltage, service wire size, quantity, material, distance
2. Maximum available fault current; refer to one-line diagram for values
3. Clearing time of overcurrent protection devices based on available fault current. Refer to calculations and report from Section 26 05 73 for value.
4. Date of fault current study; refer to one-line diagram
5. Date of label

6. Sample Label:

480Y/277V, 6 SETS 4#750KCM CU, 75FT
39,800 AMPS AVAILABLE FAULT CURRENT
0.07 SECOND CLEARING TIME
DATE OF STUDY: 1 JAN 2017
DATE OF LABEL: 4 JUL 2017

C. Arc Energy Reduction Label:

1. Provide a separate engraved plastic laminate label centered at the top of each vertical section of the electrical gear indicating the following when applicable.

a. Applicable Systems:

1) Zone-selective interlocking system for selective coordination and arc energy reduction
2) Differential relaying system for selective coordination and arc energy reduction
3) Arc energy reducing maintenance switch
4) Energy reducing active arc flash mitigation system

D. Adjustable-Trip Over Current Protection Label:

1. Provide a separate engraved plastic laminate label adjacent to each overcurrent projection device with adjustable trip settings. Provide label separate from load identification label.

a. Label:

1) Long-time delay:
2) Long-time pickup:
3) Short-time delay:
4) Short-time pickup:
5) Instantaneous:

b. Sample Label:

Long-time delay: 10.0
Long-time pickup: 1.0
Short-time delay: 0.15
Short-time pickup: 5.0
Instantaneous: 2.0
Ground fault delay: 0.25
Ground fault: 50.0

E. Nominal System Voltage Label:

1. Where more than one nominal voltage system exists in a building or facility, the identification of color coding used in the panelboard or equipment shall be permanently posted on the interior of the door or cover.

F. Distribution panelboards and switchboards shall have each overcurrent protection device identified with name and location of the load being served ("AHU-1 LOCATED IN PENTHOUSE 1"). Provide a separate engraved plastic laminate label adjacent to each overcurrent projection device with feeder wire size, feeder wire quantity, conductor material and distance in feet. Provide label separate from load identification label and adjustable trip settings label.

1. Sample Labels for Feeders:

4#3/0 CU & 1#6 CU GND, 125FT
4#250KCM AL & 1#6 GND CU, 125FT
2 SETS 4#400KCM CU & 1#1 GND CU, 125FT

G. Branch panelboards shall be provided with typed panel schedules upon completion of the project. Existing panelboards shall have their existing panel schedules typed, with all circuit changes, additions or deletions also typed on the panel schedules. A copy of all panel schedules for the project shall be turned over as part of the O&M Manuals. Refer to Section 26 05 00 for other requirements.

3.6 ELECTRICAL WORKING CLEARANCE IDENTIFICATION

A. Products:

1. Safety Yellow paint and custom stencils

B. Provide custom identification of electrical equipment working clearances in mechanical, electrical, storage, janitorial, and similar non-public areas.

C. Identification shall include a painted rectangular box (on the finished floor) in front of the electrical equipment to define the code-required working clearance. Provide additional diagonal stripping inside the rectangle box. All painted stripping shall be safety yellow paint with 3 inch wide stripes.

1. Width of area: Width of equipment or as required by code
2. Depth of area: Depth as required by code

END OF SECTION

SECTION 26 05 73

POWER SYSTEM STUDY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Selective coordination analysis and report.

B. Arc-flash hazard analysis and report.

1.2 RELATED SECTIONS

A. Section 26 05 00 - Basic Electrical Requirements.

B. Section 26 24 13 - Switchboards.

C. Section 26 24 16 - Panelboards.

D. Section 26 32 13 - Packaged Engine Generator Systems.

E. Section 26 36 00 - Transfer Switch.

1.3 SUBMITTALS

A. The input for the power system study shall be based on the contract documents, with estimated conductor lengths[and field investigation of existing equipment types, sizes, ratings] provided by the Electrical Contractor. IMEG will provide a preliminary Power Tools for Windows project file for information, if requested.

B. Documentation of the analyses shall be submitted in a single bound electronic (PDF or equal) format and shall accompany the shop drawing submittals for equipment provided under the related work specification sections. The submittal of these related specification sections will not be reviewed without this documentation. Submit a sample arc-flash hazard label for Owner review and approval prior to printing.

1.4 REFERENCES

A. NFPA 70 - National Electrical Code (NEC).

B. IEEE 1584 - IEEE Guide for Performing Arc-Flash Hazard Calculations, latest version.

C. ANSI Z535.4 - Products Safety Signs and Labels.

1.5 SCOPE

A. Provide a power system study of the electrical system shown on the plans. The study shall include arc-fault analysis, selective coordination analysis and arc flash hazard analysis.

B. Contractor is required to provide a fully coordinated system for the normal and essential emergency electrical system or emergency electrical system and the associated normal side of each transfer switch and all other locations indicated on the one line diagram. Contractor shall provide overcurrent protective devices with the appropriate models, frame sizes, trip units, etc. as required to provide a selectively coordinated system.

PART 2 - PRODUCTS

2.1 POWER SYSTEM STUDY

A. Power systems study shall be completed in Power Tools for Windows (PTW) version[9][10] or later version or pre-approved equivalent program.

B. Power system studies including, but not limited to short-circuit analysis, selective coordination, and arc-flash analysis are inherently iterative in nature. The initial and subsequent analysis commonly requires engineering evaluation, equipment modification, setting adjustments, and revised analysis report. The power system analysis scope shall not be considered complete until all outstanding engineering, equipment and device setting solutions have been resolved and documented by a final report. The power system study vendor shall provide inclusive bid provisions for the initial, subsequent, final analysis and associated reports.

PART 3 - EXECUTION

3.1 SHORT-CIRCUIT ANALYSIS

A. Provide a complete short-circuit analysis from the utility service to and including the entire building distribution as shown on the drawings.

B. Analysis shall include the entire distribution system from the point of connection to the utility power source to the distribution panels and branch circuit panelboards.

C. Short-circuit analysis documentation shall be made in one-line diagram form showing the magnitude and location of each calculated fault. Fault current calculations shall be made at the main bus of each switchboard, distribution panel, and branch circuit panel. A summary of the fault currents available shall also be submitted and made available to the AHJ if requested.

3.2 SELECTIVE COORDINATION ANALYSIS

A. Provide a complete selective coordination analysis comparing time/current curves of the protective devices to be installed to assure coordination between main and downstream devices. Overcurrent protection devices shall be coordinated based on the maximum available fault current results of the short-circuit analysis report.

B. Provide a complete selective coordination analysis, comparing time/current curves of the protective devices to be installed to assure complete selectivity between main and downstream devices for code-required branches and branches identified on one-line drawings. Overcurrent protective devices serving the essential electrical system shall selectively coordinate for the period of time that a fault's duration extends beyond 0.01 second. Overcurrent protective devices serving the normal shall selectively coordinate for the period of time that a fault's duration extends beyond 0.01 second.

C. Existing Distribution, Selective Coordination, and Analysis:

1. The scope of work includes modification, replacement, adjustments, or additions of the emergency distribution system. A complete analysis and evaluation of the existing[life safety and critical][Emergency and Legally required] branches is required in addition to the evaluation and analysis of the new distribution system components.
2. The contractor shall provide field investigation service to collect all pertinent information required for a complete analysis and evaluation including but not limited to:

    a. Over Current Protection Device (OCPD): Manufacturer, model, ratings, and settings
    b. Feeder and Branch Circuit Conductor: Wire gauge sizes, lengths, and material type
    c. Transformers: Manufacturer, model, transformer KVA, impedance, phase, voltage, configuration
    d. Transfer Switch: Manufacturer, model, transfer switch voltage, amp rating, 3 or 4 pole configurations, switch style, short circuit withstand current rating
    e. Emergency Power Supply: Manufacturer, model, power source type, voltage, amperage, ratings, fault current contribution values
    f. Existing Distribution System Documentation: One line or riser diagram relationship of all distribution equipment including switchboards, switchgear, distribution panels, branch panelboards, transformers, transfer switches, emergency power supply, all line side normal and emergency power systems serving the applicable branches from the main electrical service and emergency power supply to the final branch circuit over current protection device.

D. Provide trip settings for all (selectively coordinated and non-selectively coordinated) adjustable trip over current protection devices including long time delay, long time pickup, short time delay, short time pickup, instantaneous and ground fault. Selectively coordinated branches shall be based on the selective coordination study results. Non-selective coordinated branches shall be based on the design trip ratings. Provide selective coordination between all ground fault trip settings.

E. The analysis shall include primary protective device, secondary main switchboard/switchgear device(s), switchboard/switchgear branch feeder devices, generator breaker, distribution panel, panelboard main devices, and branch feeder devices.

F. The analysis shall include all normal, equipment, legally required, and optional standby overcurrent protection devices served by the same electrical bus and directly in parallel with the emergency branch requiring selective coordination.

G. The coordination plots provided shall indicate graphically the coordination proposed for the system on full-size log forms and shall define the types of protective devices selected, together with proposed time dial and pickup settings required. The plots shall include titles, representative one-line diagrams, legend, complete parameters for transformer(s), and complete operating bands for circuit breaker trip devices, fuses, etc.

1. The long-time region of the coordination plots shall designate the pickups required for the circuit breakers.
2. The short-time region shall indicate the magnetizing in-rush and ASA-withstand-transformer parameter, the circuit breaker, short-time and instantaneous trip devices, fuse-manufacturing tolerance bands, significant symmetrical fault currents, etc.
3. Molded case circuit breakers shall be separated from each other and the associated primary protective device by a 16% current margin for coordination and protection in the event of secondary line-to-line faults.
4. Include zone selective interlocking, differential relaying, and other selective coordination technology in the study when required by other specification sections.
5. The protective device characteristics or operating bands shall be suitably indicated to reflect the actual symmetrical fault currents sensed by the device.
6. The drawings and specifications indicate the general requirements for motors, motor-starting equipment, and medium-voltage and low-voltage equipment, but additional specific requirements of equipment furnished shall be determined in accordance with the results of the coordination study.

    a. The study shall include verification of equipment ratings and settings. The Contractor shall keep the study up-to-date with any project changes which affect the study and submit the revised study for review. A final electronic copy shall be submitted with the record drawings.

H. Provide summary table of adjustable overcurrent protective devices settings for the operating and maintenance manual.

3.3 ARC FLASH HAZARD ANALYSIS

A. The arc flash hazard analysis shall be performed according to the IEEE 1584 equations that are presented in NFPA70E.

B. The flash protection boundary and the incident energy shall be calculated at all significant locations in the electrical distribution system (switchboards, switchgear, unit substations, motor-control centers, panelboards, busway, and splitters) where work could be performed on energized parts.

C. Safe working distances shall be based on the calculated arc flash boundary considering an incident energy of 1.2 cal/cm2.

D. When appropriate, the short circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit analysis and coordination study models. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations.

E. The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios must be compared, and the greatest incident energy must be uniquely reported for each equipment location. Calculations must be performed to represent the maximum and minimum contributions of fault current magnitude for all normal and emergency operating conditions. The minimum calculation will assume that the utility contribution is at a minimum and will assume a minimum motor contribution (all motors off). Conversely, the maximum calculation will assume a maximum contribution from the utility and will assume the maximum amount of motors to be operating. Calculations shall take into consideration the parallel operation of synchronous generators with the electric utility, where applicable.

F. The incident energy calculations must consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors and generators should be decremented as follows:

1. Fault contribution from induction motors should not be considered beyond 3 to 5 cycles.
2. Fault contribution from synchronous motors and generators should be decayed to match the actual decrement of each as closely as possible (e.g., contributions from permanent magnet generators will typically decay from 10 per unit to 3 per unit after 10 cycles).

G. For each equipment location with a separately enclosed main device (where there is adequate separation between the line side terminals of the main protective device and the work location), calculations for incident energy and flash protection boundary shall include both the line and load side of the main breaker.

H. When performing incident energy calculations on the line side of a main breaker (as required per the above), the line side and load side contributions must be included in the fault calculation.

I. Miscoordination should be checked among all devices within the branch containing the immediate protective device upstream of the calculation location, and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.

J. Where it is not physically possible to move outside the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.

K. Create and install NFPA 70E compliant labels describing the arc flash hazard level at all switchboards, panelboards, and other locations in the electrical distribution system where work could be performed on energized parts.

L. Labels shall be vinyl or laminated, with a self-adhesive backing, conform with ANSI Z535.4 Products Safety Signs and Labels standard, and include the following:

1. Arc flash boundary
2. Available incident energy calculated in the analysis and the corresponding working distance, or the arc flash personal protective equipment (PPE category) for the equipment, but not both.

M. Examples showing the minimum required information follow:

N. A list of all hazard categories and the corresponding PPE requirements shall be posted in the main electric room, engineering office, or other location. The list shall be plastic laminate or typewritten and housed in a plastic frame.

3.4 ADJUSTMENTS

A. Manufacturer's authorized representative or Contractor shall set all adjustable protective devices to values indicated in the approved coordination study. Apply settings prior to placing equipment into operation. When the scope of work or execution includes remodel or phases construction, the contractor shall adjust applicable settings as required prior to each system component placed in operation.

B. Wherever the arc flash incident energy exceeds Arc Flash Category 2 (i.e., greater than 8 cal/cm^2), provide options for adjusting breaker trip times, if possible, to reduce energies to Category 2 or below.

END OF SECTION

SECTION 26 20 00

SERVICE ENTRANCE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Arrangement with Utility Company for permanent electric service.

B. Underground service entrance.

1.2 RELATED SECTIONS AND WORK

A. Refer to the One-Line Diagram for additional information.

1.3 SYSTEM DESCRIPTION

A. System Voltage: 208Y/120 volts, three phase, four-wire, 60 Hertz.

PART 2 - PRODUCTS

2.1 METERING EQUIPMENT

A. Meter: Furnished by the Utility Company.

B. Meter Base: Furnished by the Contractor, as approved by the Utility Company. (Manufacturers: Milbank, Superior, Duncan, or Anchor).

C. Metering Transformer Compartment: Furnished as part of the main switchboard to Utility Company's specifications.

D. Exterior Mounted Metering Cabinets: Furnished and installed by the Contractor to Utility Company's specifications. Conduit and conductors between metering cabinets and instrumentation shall be by the Contractor. Connections as required by the Utility Company.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Make arrangements with Utility Company to obtain permanent electric service to the Project.

B. Primary distribution equipment and pad-mounted transformers shall be furnished and installed by the Utility Company.

C. Primary conductors shall be furnished, installed, and terminated by the Utility Company. Primary conduit shall be furnished and installed by the Contractor, as shown on the drawings, to the Utility Company's requirements.

D. Underground: Install service entrance conduits in concrete envelope from Utility Company's pad mounted transformer to meter cabinet and building service entrance equipment. Utility Company will connect service conductors to transformer secondary lugs.

E. Overhead: Install a rigid metal weather head and service entrance conductors. Service entrance conductors shall have a 3' drip loop beyond the weather head. Overhead service shall comply with NEC 230 Part II.

F. Concrete Pad for Transformer: Furnished and installed by the Contractor to Utility Company's specifications.

END OF SECTION

SECTION 26 24 13

SWITCHBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Main and distribution switchboard.

1.2 RELATED SECTIONS AND WORK

A. Refer to the Electrical Distribution Diagram and Electrical Schedules for size, rating, and configuration.

1.3 REFERENCES

A. ANSI C12 - Code for Electricity Metering.

B. ANSI C39.1 - Requirements for Electrical Analog Indicating Instruments.

C. ANSI C57.13 - Requirements for Instrument Transformers.

D. NEMA AB 1 - Molded Case Circuit Breakers.

E. NEMA KS 1 - Enclosed Switches.

F. NEMA PB 2 - Dead Front Distribution Switchboards.

G. NEMA PB 2.1 - Instructions for Safe Handling, Installation, Operation and Maintenance of Deadfront Switchboards Rated 600 Volts or less.

1.4 SUBMITTALS

A. Include front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars per phase, neutral, and ground; switchboard instrument details; instructions for handling and installation of switchboard; and electrical characteristics including voltage, frame size and trip ratings, withstand ratings, and time-current curves of all equipment and components.

1.5 SPARE PARTS

A. Keys: Furnish four each to the Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the site under provisions of Section 26 05 00.

B. Deliver in 48-inch maximum width shipping splits, unless approved otherwise by both the Contractor and Architect/Engineer, individually wrapped for protection, and mounted on shipping skids.

C. Store and protect products under provisions of Section 26 05 00.

D. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

E. Handle in accordance with NEMA PB2.1 and manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 26 05 00.

B. Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

PART 2 - PRODUCTS

2.1 GENERAL

A. Approved Manufacturers:

1. Square D Class 2700 QED-2, I-Line, Powerstyle
2. ABB ReliaGear SB
3. Siemens
4. Eaton

2.2 RATINGS

A. Definitions:

1. Series rated equipment shall be defined as equipment that can achieve a required UL AIC rating with an upstream device such as a main breaker or a combination of devices to meet or exceed a required UL AIC rating. All series rated equipment shall have a permanently attached nameplate indicating that device rating must be maintained. Refer to Section 26 05 53 for additional requirements.
2. Fully rated equipment shall be defined as equipment where all devices in that equipment shall carry a minimum of the AIC rating that is specified.

B. The switchboards for this project shall be fully rated[unless otherwise specifically noted in the Drawings or Specifications.

2.3 SWITCHBOARD CONSTRUCTION AND RATINGS

A. Factory-assembled, dead front, metal-enclosed, and self-supporting switchboard assembly conforming to NEMA PB2, and complete from incoming line terminals to load-side terminations.

B. Switchboard electrical ratings and configurations as shown on the drawings.

C. Line and Load Terminations: Accessible from the front only of the switchboard, suitable for the conductor materials used.

D. Bus Connections: Bolted, accessible from front only for maintenance. Plug-on connections may be utilized with Architect/Engineer's pre-approval by addenda.

E. Bus bars shall be fully isolated, braced for minimum ampere rms symmetrical rating as indicated on drawings.

F. The bus shall extend the full height of the distribution sections to provide space for future breakers.

G. Provide a 1 X 1/4-inch copper ground bus through the length of the switchboard.

H. Provide metering transformer compartment for Utility Company's use. Compartment size, bus spacing and drilling, door, and locking and sealing requirements shall be in accordance to Section 26 20 00 and Utility Company specifications.

I. Enclosure shall be NEMA PB 2; Type 1 - General-Purpose. Sections shall align at front and rear. Provide removable panel access or hinged door with flush lock and all keyed alike. Door hardware shall provide swing clear operation (180-degree swing).

J. Switchboard Height: NEMA PB 2; 92 inches, excluding floor sills, lifting members and pull boxes.

K. Pull Box: Same construction as switchboard, size as shown on the drawings. Top and sides shall be removable. Insulating, fire-resistive bottom with separate openings for each circuit to pass into switchboard.

L. Pull Section: Same construction as switchboard, size as shown on the drawings. Depth and height to match switchboard. Arrange as shown on the drawings.

M. Future Provisions: In addition to the spare devices shown, provide a minimum of 15 inches of fully equipped space for future devices with bussing and bus connections, suitably insulated and braced for short circuit currents. Continuous current rating as indicated on the drawings.

N. Suitable for use as service entrance equipment. Provide line side (service style) barriers.

2.4 INSTRUMENTS AND SENSORS

A. Current Transformers: ANSI C57.13; 5 ampere secondary, bar or window type, with single secondary winding, unless otherwise required for application, and secondary shorting device, primary/secondary ratio as required, burden and accuracy consistent with connected metering and relay devices, 60 Hertz.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install switchboard in locations shown on the drawings, in accordance with manufacturer's written instructions and NEMA PB 2.1.

B. Tighten accessible bus connections and mechanical fasteners after placing switchboard.

C. Install fuses in each switch.

3.2 FIELD QUALITY CONTROL

A. Inspect completed installation for physical damage, proper alignment, anchorage, and grounding.

B. Measure insulation resistance of each bus section phase to phase and phase to ground for one minute each. Test voltage shall be 1000 volts, and minimum acceptable value for insulation resistance is 2 megohms.

C. Check tightness of accessible bolted bus joints using a calibrated torque wrench. Tightness shall be in accordance with manufacturer's recommended values.

D. Physically test key interlock systems to ensure proper function.

3.3 ADJUSTING AND CLEANING

A. Adjust all operating mechanisms for free mechanical movement.

B. Touch up scratched or marred surfaces to match original finish.

C. Provide time/current trip curves for all adjustable protection devices that require setting. Also provide curves and equipment information for associated new and existing fixed devices that require coordination with new protection devices. Submit time/current curves in hard copy or electronic format.

D. Adjust trip and time delay settings to values as scheduled, or as instructed by the Architect/Engineer.

E. Where two levels of ground fault are provided, test ground fault circuit breakers to prove selective coordination in accordance with manufacturer's directions. Provide testing documentation with Operating & Maintenance Manual submittals.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Service and distribution panelboards.

B. Lighting and appliance branch circuit panelboards**.**

1.2 RELATED SECTIONS AND WORK

A. Refer to the Electrical Distribution Diagram and Electrical Schedules for size, rating, and configuration.

1.3 REFERENCES

A. NEMA AB 1 - Molded Case Circuit Breakers.

B. NEMA FU 1 - Low voltage cartridge fuses.

C. NEMA KS 1 - Enclosed Switches.

D. NEMA PB 1 - Panelboards.

E. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

F. NEMA PB 1.2 - Application Guide for Ground-fault Protective Devices for Equipment.

G. UL 248 - Low-Voltage Fuses.

H. UL 67 - Panelboards.

1.4 SPARE PARTS

A. Keys: Furnish four (4) each to the Owner.

B. Fuses: Furnish 10% or a minimum of three (3) spare fuses of each type and rating installed to the Owner.

C. Fuse Pullers: Furnish one (1) fuse puller to the Owner.

PART 2 - PRODUCTS

2.1 MAIN AND DISTRIBUTION PANELBOARDS

A. General

1. Manufacturers:

a. Square D QMB, I-Line
b. ABB ReliaGear neXT
c. Siemens F2, P4
d. Eaton PRL4, PRL5

B. Panelboards: NEMA PB 1; type as shown on the drawings.

C. Enclosure: NEMA PB 1; Type 1.

D. Provide cabinet front with concealed trim clamps and hinged trim on door to allow access to wiring gutters without removal of trim and flush lock. Door hardware shall provide swing clear operation (180-degree swing). Finish in manufacturer's standard gray enamel.

E. Provide panelboards with copper bus, ratings as scheduled on the drawings. Provide copper ground bus in all panelboards.

F. All spaces shown on the one-line diagram shall be fully prepared spaces for future breakers.

G. Minimum Integrated Short Circuit Rating: 100,000 amperes rms symmetrical for 240-volt panelboards; 50,000 amperes rms symmetrical for 480-volt panelboards, or as shown on the drawings.

H. Fusible Switch Assemblies: NEMA KS 1; quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position.

I. Fuse Clips (Switches 600 Amperes and Smaller): Provide with Class 'R' rejection clips. Fuse Clips (601 Amperes and Larger): Designed to accommodate Class 'L' fuses.

J. Molded Case Circuit Breakers: Provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole.

K. Molded Case Circuit Breakers with Current Limiters: Provide circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole.

L. Current Limiting Molded Case Circuit Breakers: Provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

M. Solid State Molded Case Circuit Breakers: (All breakers identified on plans as solid-state with 1,200 ampere frame sizes and below.) Provide molded case switch with electronic sensing, timing, and tripping circuits for fully adjustable time current characteristic settings including ground fault trip, instantaneous trip, long time trip, long time delay, short time trip, and short time delay. Trip setting shall be field programmable with restricted access and a sealable clear cover.

2.2 BRANCH CIRCUIT PANELBOARDS

A. General

1. Manufacturers:

a. Square D NQ, NF
b. ABB ReliaGear Series
c. Siemens P1
d. Eaton PRL1, PRL2

B. Lighting and Appliance Branch Circuit Panelboards: NEMA PB 1; circuit breaker type.

C. Enclosure: NEMA PB 1; Type 1.

D. Provide cabinet front with door-in-door construction, concealed hinge, and flush lock all keyed alike. Door hardware shall provide swing clear operation (180-degree swing). Finish in manufacturer's standard gray enamel.

E. Provide panelboards with copper bus, ratings as scheduled on the drawings. Provide copper ground bus in all panelboards.

F. All unlabeled circuits shown on the panelboard schedule shall be fully prepared spaces for future breakers.

G. All multiple-section panelboards shall have the same dimensional back box and cabinet front size.

H. Minimum Integrated Short Circuit Rating: As shown on the drawings.

I. Provide handle lock-on devices for all breakers serving exit sign and lighting circuits with emergency battery units. Provide handle lock-on devices and red handles for breakers serving fire alarm panels.

J. Molded Case Circuit Breakers: Bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where scheduled on the drawings. Do not use tandem circuit breakers.

K. Current Limiting Molded Case Circuit Breakers: Provide circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

L. Suitable for use as service entrance equipment. Provide line side (service style) barriers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards plumb as indicated on the drawings in conformance with NEMA PB 1.1.

B. Height: 6 feet to handle of highest device.

C. Provide filler plates for unused spaces in panelboards.

D. Provide custom typed circuit directory for each branch circuit panelboard. Provide updated custom typed circuit directory for each existing branch circuit panelboard with new or revised circuits per the scope of work. Label shall include equipment name or final approved room name, room number, and load type for each circuit (examples: SUMP SP-1 or ROOM 101 RECEPT). Revise directory to reflect circuit changes required to balance phase loads. Printed copies of the bid document panel schedules are not acceptable as circuit directories.

E. Stub five (5) empty one-inch conduits to accessible location above ceiling out of each recessed panelboard.

F. Install fuses in fusible switch assemblies.

3.2 REFURBISHED ENCLOSURES - NEW PANELBOARDS

A. Existing panelboard enclosures may be reused to house new panelboards pending documented verification of the following provided with the applicable new equipment submittals.

1. New branch panelboard is listed for the existing enclosure or application.
2. Existing enclosure and new equipment is field evaluated by the manufacturer or nationally recognized testing laboratory for the available fault current, condition, and application.
3. Authority Having Jurisdiction AHJ approval.

END OF SECTION

SECTION 26 28 16

DISCONNECT SWITCHES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fusible switches.

B. Non-fusible switches.

C. Molded case circuit switches.

D. Molded case switches.

E. Motor disconnect switch.

F. Enclosures.

1.2 RELATED SECTIONS AND WORK

A. Refer to the Disconnect and Starter Schedule for rating and configuration.

1.3 REFERENCES

A. NEMA KS 1 - Enclosed Switches.

1.4 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 FUSIBLE AND NON-FUSIBLE SWITCHES

A. Acceptable Manufacturers:

1. Square D 3110 Series
2. Eaton DH Series
3. ABB TH Series
4. Siemens HNF / HF Series

B. Fusible Switch Assemblies: NEMA KS 1; Type heavy duty, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position without a tool. Handle lockable in OFF position. Fuse Clips: Class 'R' fuse clips only, unless indicated otherwise on the drawings.

C. Non-fusible Switch Assemblies: NEMA KS 1; Type heavy duty, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle interlocked to prevent opening front cover with switch in ON position without a tool. Handle lockable in OFF position.

D. Enclosures: Type as indicated on the disconnect schedule.

E. Accessories: Provide the following accessories. Refer to Disconnect Schedule for additional requirements for each application.

1. Lockable
2. Provide finger safe barriers for exposed line-side terminations and energized components when the switch is in the open position.

2.2 MOLDED CASE CIRCUIT BREAKERS AND SWITCHES

A. Acceptable Manufacturers:

1. Square D
2. Eaton
3. ABB
4. Siemens

B. Molded Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.

1. Thermal Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
2. Adjustable Instantaneous Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip settings.
3. Electronic Trip Unit Circuit Breakers: RMS sensing; field-replaceable rating plug; with the following field-adjustable settings:

    a. Instantaneous trip.
    b. Long- and short-time pickup levels.
    c. Long- and short-time adjustments.
    d. Ground-fault pickup level, time delay, and I2t responses.

4. Current Limiting Circuit Breakers: Frame sizes 400 A and smaller and let-through ratings less than NEMA FU 1, RK-5.

C. Molded Case Switches: Molded case circuit breaker with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating.

D. Accessories: Provide the following accessories. Refer to Disconnect Schedule for additional requirements for each application.

1. Lockable
2. Provide finger safe barriers for exposed line-side terminations and energized components when the switch is in the open position.

2.3 MOTOR DISCONNECT SWITCH

A. Acceptable Manufacturers:

1. Square D 3110 Series
2. Eaton r5 Series
3. ABB ML Series
4. Siemens LBR Series

B. Rotary Switch Assemblies: Rated for making and breaking loads, rotary type enclosed switch with externally operable handle interlocked to prevent opening front cover with switch in ON position without a tool. Handle lockable in OFF position.

C. Enclosures: Type as indicated on the Disconnect Schedule.

D. Ground lug connection provided in enclosure.

E. Accessories: Provide the following accessories. Refer to Disconnect Schedule for additional requirements for each application.

1. Lockable
2. Provide finger safe barriers for exposed line-side terminations and energized components when the switch is in the open position.

F. Listed UL 508 suitable for motor control.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install disconnect switches where indicated on the drawings.

B. Install fuses in fusible disconnect switches.

C. Field coordinate installation with other contractors and equipment to maintain code required working space requirements.

D. Provide adhesive label on inside door of each switch indicating UL fuse class and size for replacement.

3.2 ADJUSTING

A. Set field-adjustable circuit breaker trip ranges.

END OF SECTION

SECTION 26 32 13

PACKAGED ENGINE GENERATOR SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Packaged engine generator system.

B. Remote annunciator panel.

C. Battery and charger.

D. Weatherproof enclosure.

E. Roof mounted load bank.

F. Cellular call out accessory.

1.2 REFERENCES

A. ANSI/NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

B. ANSI/NEMA AB 1 - Molded Case Circuit Breakers.

C. ANSI/NEMA MG 1 - Motors and Generators.

D. NFPA 37 - Installation and Use of Stationary Combustion Engines and Gas Turbines.

E. NFPA 70 - National Electrical Code (NEC).

F. NFPA 99 - Standard for Health Care Facilities.

G. NFPA 110 - Standard for Emergency and Standby Power Systems.

H. IEEE 446 - Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.

I. Environmental Protection Agency EPA Emission Standards for Compressed Ignition Engines.

J. Noise Emission: Comply with applicable state and local government requirements for maximum noise level at property boundaries due to sound emitted by the generator set, its components and the operation thereof.

1.3 SUBMITTALS

A. Submit shop drawings showing plan and elevation views with overall and interconnection point dimensions, fuel consumption rate curves at various loads, ventilation and combustion air requirements, and electrical diagrams including schematic and interconnection diagrams.

B. Submit product data showing dimensions, weights, ratings, interconnection points, and internal wiring diagrams for engine, generator, control panel, battery, battery rack, battery charger, exhaust silencer, vibration isolators, day tank, remote radiator, and remote annunciator.

1. Include work clearance and equipment access information. Clearly identify required equipment access locations for installation, maintenance, testing, and repair.

C. Submit certificates for compliance with Tier 4 EPA Emissions Standards for Compressed Ignition Engines

D. Submit manufacturer's installation instructions under provisions of Section 26 05 00.

1.4 EXTRA MATERIALS

A. Submit maintenance materials under provisions of Section 26 05 00.

B. Furnish one set of tools required for preventative maintenance of the engine generator system. Package tools in adequately sized metal toolbox.

C. Provide two additional sets of each fuel, oil, and air filter element required for the engine generator system. Provide additional fuel polishing filters for one year of operation.

D. Provide one fuse for every type and rating used.

E. Provide five (5) extra DC incandescent lamps and five (5) compact fluorescent lamps.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 26 05 00.

B. Store and protect products under provisions of Section 26 05 00.

C. Accept packaged engine generator set and accessories on site in crates and verify damage.

D. Protect equipment from dirt and moisture by securely wrapping in heavy plastic.

1.6 SYSTEM DESCRIPTION

A. Engine generator system to provide source of emergency and standby power.

B. Emergency Power Supply System (EPSS) shall be NFPA 110 Type 10 Operation: In accordance with ANSI/NFPA 110.

1.7 COORDINATION DRAWINGS

A. Reference Coordination Drawings article in Section 26 05 00 for required generator electronic CAD drawings to be provided to Coordinating Contractor for inclusion into composite coordination drawings. Show generator, fuel system components, battery system components, and exhaust system in 1/4" scale plan of room.

1.8 PROJECT RECORD DOCUMENTS

A. Submit record documents under provisions of Section 26 05 00.

B. Accurately record location of engine generator and mechanical and electrical connections.

1.9 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 26 05 00.

B. Include instructions for normal operation, routine maintenance requirements, service manuals for engine and day tank, oil sampling and analysis for engine wear, and emergency maintenance procedures.

1.10 QUALIFICATIONS

A. Manufacturer: Company specializing in packaged engine generator system with minimum five (5) years documented experience.

B. Manufacturer: Company with minimum five (5) years of documented on-board paralleling system experience.

C. Supplier: Authorized distributor of engine generator manufacturer with service facilities within 50 miles of the project site.

1.11 MAINTENANCE SERVICE

A. Furnish service and preventative maintenance of packaged engine generator system for five (5) years from Date of Substantial Completion. Maintenance service shall be performed by skilled employees of manufacturer's designated service organization. Include quarterly exercising, and routine preventive maintenance as recommended by manufacturer and adjusting as required for proper operation. Maintenance agreements shall include parts, supplies, and labor.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Caterpillar.

B. Cummins Power Generation.

C. Kohler.

D. Generac.

2.2 PACKAGED ENGINE-GENERATOR SET

A. Packaged engine-generator set shall be a coordinated assembly of compatible components. Stationary generators shall be listed.

B. Safety Standard: Comply with ASME B15.1 and UL 2200.

C. Emission Standard: EPA Tier 4

D. Nameplates: Each major system component shall be equipped with a nameplate to identify manufacturer's name and address, model and serial number, and component rating in integrated set and as required by the contract documents.

E. Fabricate engine-generator set mounting frame and attachment of components to resist generator-set movement during a seismic event when generator-set mounting frame is anchored to building structure.

F. Mounting Frame: Adequate strength and rigidity to maintain alignment of mounted components without depending on concrete foundation. Mounting frame shall be free from sharp edges and corners and shall have lifting attachments arranged for lifting with slings without damaging components. Provide a rigging diagram permanently attached to the mounting frame to indicate the capacity of each lifting attachment and the generator-set center of gravity.

2.3 ENGINE

A. Type: Water-cooled in-line or V-type, compression internal combustion engine.

B. Rating: Sufficient to operate at 100 percent load for two hours at specified elevation and ambient limits.

C. Governor: Isochronous type with speed sensing.

D. Safety Devices: Engine shutdown on high water temperature, low oil pressure, overspeed, and engine over crank. Limits as selected by manufacturer.

E. Fuel System: Engine mounted diesel fuel pump and relief-bypass valve.

F. Fuel Supply System:

1. Base-Mounted Fuel Tank: UL 142 listed fuel tank with 48 hour rated (NFPA 110 minimum run time by class) capacity. Integral rupture basin with leak detection. Provide fueling port with an overfill prevention type receptacle and lockable cap for exterior units. The tank shall include structural steel supports for top mounted engine generator set. Furnish complete with flexible fuel line connectors lockable cover, and analog level gauge. Furnish complete with float switches to indicate low fuel level. The footprint of the base-mounted fuel tank shall not exceed the footprint of the generator frame for interior applications or the footprint of the enclosure for exterior installations.

G. Fuel Polishing System:

1. Fuel polishing system capable of removing 99% of emulsified water and particulate down to 3 microns from the fuel. The system shall be sized so the stored fuel capacity shall be polished at least once per week. The system shall include a pump to circulate the fuel from the storage tank through the filter/separator and return it to the tank, A gauge or alarm shall provide notification when a filter is due for change. A timer shall be set to run the pump during off peak hours.

H. Lubrication System: Engine or skid mounted filter and strainer, thermostatic control valve capable of full flow and designed to be fail safe, and crankcase drain arranged for gravity drainage with siphon or pump.

I. Engine Jacket Heater: Thermal circulation type water heater with integral thermostatic control, sized to maintain engine jacket water at 90°F, and suitable for operation on 208-3Ø volts AC. The minimum wattage of the heater shall be watts or as recommended by the manufacturer.

J. Engine Starting: DC starting system with positive engagement, number and voltage of starter motors in accordance with manufacturer's instructions. Include remote starting control circuit, with MANUAL-OFF-REMOTE selector switch on engine-generator control panel. Provide the following accessories:

1. Battery: Voltage to match starter with capacity for three cranking cycles without recharge. Provide with battery cables and acid resistant battery tray.
2. Battery-Charging Alternator: Factory mounted on engine with solid state voltage regulation.
3. Remote Start Circuit Monitoring: Provide continuous monitoring of the generator start circuits. A failure shall initiate visual and audible alarms at the generator, remote annunciators, and start the generator.
4. Battery Charger: Current limiting type designed to float at 2.17 volts per cell and equalize at 2.33 volts per cell. Include overload protection, full wave rectifier, DC voltmeter and ammeter, and 120 volts AC fused input. Provide wall-mounted enclosure to meet ANSI/NEMA 250, Type 1 requirements.

5. DC Power Supply/Charger: Utility grade current limiting type with battery temperature compensation designed to float at 2.17 volts per cell and equalize at 2.33 volts per cell. Include overload protection, full wave filtered rectifier, digital DC voltmeter and ammeter, and 120 volts AC fused input. Provide wall-mounted enclosure to meet ANSI/NEMA 250, Type 1 requirements.

K. Exhaust System: Hospital grade type silencer (75 dBA max at 10 feet), side inlet with muffler companion flanges and flexible stainless steel exhaust fitting, suitable for horizontal orientation, sized in accordance with engine manufacturer's instructions. Silencer shall include a threaded opening for connection of ¾" drain line. Opening shall be flush on inside of silencer.

2.4 CONTROLS AND INDICATION

A. Operating and safety indications, protective devices, basic system controls, and engine gauges shall be grouped in a common control and monitoring panel mounted on the generator set. Mounting method shall isolate the control panel from generator-set vibration.

B. Ground Fault: Provide ground fault sensing at the generator. The sensor shall be located ahead of the generator service disconnect. Provide a ground fault indication on the engine-generator control panel. Provide an instruction nameplate at the control panel.

1. Instruction nameplate: Provide operational instructions for a ground fault indication as approved by the local Authority Having Jurisdiction.

C. Engine-Generator Control Panel: ANSI/NEMA 250, Type 1 generator mounted control panel enclosure with engine and generator controls and indicators. Include provision for padlock and the following equipment and features:

1. Alarm indication as required by NFPA 110 for a Level 1 system.
2. AC frequency meter.
3. AC output voltmeter with phase selector switch.
4. AC output ammeter with phase selector switch.
5. Output voltage adjustment.
6. DC voltmeter (alternator battery charging).
7. Engine start/stop selector switch.
8. Engine running time meter.
9. Oil pressure gauge.
10. Engine coolant temperature gauge.
11. Shut down devices for overspeed, coolant high-temperature, coolant low-level, and oil low-pressure.
12. Fuel derangement alarm.
13. Generator overload.
14. Auxiliary Relay: 3PDT, operates when engine runs, with contact terminals prewired to terminal strip.
15. Remote Alarm Contacts: Pre-wire SPST contacts to terminal strip for remote alarm functions required by ANSI/NFPA 99.
16. Ground fault indication.
17. Generator control and start signal failure.

18. On-board paralleling controls.
19. 80% load alarm.
20. Key switch, three-position selection switch.
21. Segregated low voltage (DC) wiring panel and required AC/DC power supply.

D. Remote Engine Annunciator Panel: ANSI/NFPA 99 and NFPA 110 for a Level 1 system. Include the listed pre-alarm and alarm points, audible alarm, alarm silencing means, repetitive alarm circuitry, and lamp test switch in a surface mounted panel with brushed stainless steel finish. Provide all interconnecting wiring in conduit per manufacturer's requirements by the Electrical Contractor. The remotely reported alarms shall include the following.

1. Over crank
2. Low water (engine) temperature
3. High engine temperature pre-alarm
4. High engine temperature
5. Low lube oil pressure pre-alarm
6. Low lube oil pressure
7. Overspeed
8. Low fuel main tank
9. Low coolant level
10. Not in auto
11. Emergency Power Supply (EPS) supplying load
12. High battery voltage
13. Low battery voltage
14. Battery charger failure (includes AC failure)
15. Generator running
16. Normal utility power
17. Emergency stop
18. Rupture basin alarm
19. Emergency Power Off Switch activated (EPO)
20. Alarm for power supply or UPS serving motorized breakers
21. Generator control and start signal failure.
22. On-board paralleling controls.
23. 80% load alarm.

E. Remote Engine Manual Start Control: Two-wire remote start control from fire command center. Provide all interconnecting wiring in conduit per manufacturer's requirements (by the Electrical Contractor).

F. Building Automation System Integration:

1. Provide a terminal block to allow the Facility Monitoring and Control System (FMCS) to report generator alarms. Provide individual terminal points for each of the annunciator alarms and pre-alarms. Provide an additional terminal point to combine all generator alarms under a single terminal point. Provide a permanent label for each terminal point. Each terminal will provide a binary output for the FMCS to read. Refer to Section 23 09 00 for alarms reported by the FMCS.

2.5 ROOF MOUNTED LOAD BANK

A. The generator load bank shall be a completely self-contained unit that includes all resistive load elements, load control devices, load element branch circuit fuse protection, terminal, system protection devices and NEMA enclosure.

B. System protection shall include protection against overheating by disconnecting the load elements and activating an alarm. Load element control shall be a magnetic contactor with fuses. A remote load dump circuit shall remove the load bank upon opening of a contact in the automatic transfer switches.

C. Control power shall be derived internally from the main load bus. Control and protective circuits shall operate at 120 volt via a control power transformer and shall be fused.

D. The load bank shall be installed on the roof. Coordinate mounting with ventilation contractor.

E. The control section shall be thermally isolated from the load elements and airflow. Load bank power and control wiring shall be 150°C XLP insulated.

F. Load Bank Rating:
   1. Voltage: 208 volts.
   2. Load Bank Controls:
      a. Manual controls including:
         1) Power ON/OFF switch
         2) Master load ON/Off switch
         3) Load step control switches
         4) Over-temperature alarm indicator.

G. Load Bank Wiring:
   1. Contractor shall wire load bank power and controls. Wire remote load dump control to all automatic transfer switches connected to generator distribution.
      a. Manufacturers:
         1) Simplex, Inc.
         2) LBD series
         3) Avtron Loadbank, Inc. K711 series.

2.6 OUTDOOR GENERATOR-SET ENCLOSURE SKIN-TIGHT

A. Prefabricated or pre-engineered skintight enclosure with the following features:

1. Construction: Reinforced galvanized steel, metal clad, integral structural steel framed housing anchored to a concrete foundation. Panelized aluminum housing with integral structural framing anchored to a concrete foundation. Construction shall allow access to control panels and service points. The panels shall enclose all components, including intake/exhaust louvers and sound attenuators. Extend the enclosure base frame as required for panels.
2. The generator control panel shall be located no greater than 5'-0" above finished grade for ease of access.
3. Structural Design and Anchorage: Wind resistant up to 100 mph.
4. Louvers: Equipped with bird screen and filter arranged to permit air circulation when engine is not running while excluding exterior dust, birds, and rodents. Motor operators shall be spring open, power close operating at 24 volts DC. The louvers shall be connected to the generator starting batteries through appropriate control relays. Louvers shall not extend outside main generator enclosure.
5. Hinged Doors: Provide a minimum of four doors with padlocking provisions. Single doors shall be 36" wide and 84" high. Double doors shall be 60" wide and 84" high. As standard, doors shall include rain-rail moldings above all door openings, recessed, keyed mortise locks, panic bar door hardware and full weather-stripping. Doors shall be removable.
6. Thermal Insulation: Manufacturer's standard materials and thickness selected in coordination with space heater to maintain winter interior temperature within operating limits as required by engine-generator-set components.
7. Fuel Tank Vent: Provide vent piping from the fuel tank to the exterior of the enclosure.
8. Fuel Fill: Provide fill access on the exterior of the enclosure at an elevation not to exceed 5'-0" above finished grade.
9. The exhaust system silencer shall be installed within the enclosure housing.
10. Acoustical Treatment: Provide acoustical treatment of the generator enclosure including wall panels, intake and exhaust air paths, ventilation openings, and tailpipe exhaust. Maximum sound level horizontally from the generator set shall be 75 dBA at 23 feet in a hemispherical free field in the configuration shown on the drawings. Sound attenuators shall be concealed within the enclosure panels. Panels shall extend from the enclosure base frame to the height of the generator section.

2.7 CELLULAR CALL OUT ACCESSORY

A. Wireless monitoring & control remote telemetry unit with the following features:
1. Basis of Design: FLEETZOOM FZ300
    a. Shall be capable of notifying authorized personnel via SMS text messages and emails given triggering event i.e. loss of power.
    b. The telemetry unit shall be equipped with minimum 4G LTE cellular radio.
    c. Shall be capable of receiving the following inputs:
        1) Minimum of (14) digital inputs.
        2) Minimum of (2) analog inputs.
        3) Minimum (4) digital outputs.

d. Shall be equipped with internal onboard battery backup.
e. Prior to purchase and approval, notify DMH of any subscription costs (if any) associated with this product.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work and field dimensions are as shown on the drawings.

B. Verify that required utilities are available in proper location and ready for use.

C. Beginning of installation means installer accepts existing conditions.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install remote manual stop station in location shown on plans. Provide 120 Volt power and wiring in conduit as required. Coordinate installation with the manufacturer approved shop drawings and wiring diagrams. The remote manual stop station shall shunt trip the generator mounted circuit breaker.

C. The A-B-C phase rotation of the generator source shall match the A-B-C phase rotation of the utility source. The Contractor shall verify the generator and utility phase rotation match to prevent three phase motors and similar loads from operating backwards while being served by the generator.

D. Provide field supplies and installation of miscellaneous piping, wiring, loose shipped accessories, and other components for a turn-key and complete system. Example, provide field piping for non-ingestive crankcase ventilation system when required. Field coordinate pipe routing through the roof or side wall with manufacturer requirements and engineer.

3.3 COMMISSIONING: ON-BOARD GENERATOR PARALLELING CONTROL

A. Prepare, start, test, and adjust systems under provisions of Section 26 05 00. The on-board paralleling startup, testing, and commissioning may be conducted with other startup, testing, and commissioning requirements of this specification.

B. Provide on-site manufacturer representative for on-board generator paralleling system startup, testing, and commissioning.

C. Simulate a utility power loss test of the EPSS and on-board generator paralleling control system.

1. Refer to the emergency power system sequence of operation schedule on the drawings.

2. Report and document deviations from the sequence of operation schedule, system adjustments, and deficiencies.
3. Obtain and Submit Authority Having Jurisdiction AHJ observation and certificate of acceptable emergency power system operation when required for facility occupancy certificate.

3.4 ADJUSTING

A. Adjust generator output voltage and engine speed.

3.5 CLEANING

A. Clean work under provisions of Section 26 05 00.

B. Clean engine and generator surfaces. Replace oil and fuel filters.

END OF SECTION

SECTION 26 36 00

TRANSFER SWITCH

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Automatic transfer switch.

B. Manual transfer switch.

1.2 RELATED SECTIONS AND WORK

A. Refer to the Transfer Switch Schedule for rating and configuration.

1.3 REFERENCES

A. NEMA ICS 1 - General Standards for Industrial Control and Systems.

B. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers, and Assemblies.

C. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.

D. NEMA ICS 10 - Guide to Application of Low-Voltage Automatic Transfer Switch Equipment.

E. UL 1008 - Standard for Automatic Transfer Switches.

F. NFPA 99 - Health Care Code.

G. NFPA 110 - Standard for Emergency and Standby Power Systems.

1.4 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 26 05 00.

B. Include instructions for operating equipment.

C. Include instructions for operating equipment under emergency conditions when engine generator is running.

D. Identify operating limits which may result in hazardous or unsafe conditions.

E. Document ratings of equipment and each major component.

F. Include routine preventive maintenance and lubrication schedule.

G. List special tools, maintenance materials, and replacement parts.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code for emergency and standby electrical systems.

PART 2 - PRODUCTS

2.1 AUTOMATIC TRANSFER SWITCH WI TH DELAYED TRANSITION

A. Automatic transfer switch, microprocessor controlled, three-position switch mechanism, delayed transition and load shed capable, with local manual operation.

B. Acceptable Manufacturers, Hospital Grade:

1. Schneider Electric ASCO 7ATS Series
2. Siemens Russelectric RMT Series
3. ABB Zenith ZTS Series
4. Caterpillar CTS Series
5. Cummins OTPC / X Series

C. Description: NEMA ICS 2; automatic transfer switch.

D. Configuration: Electrically-operated, three-position delayed transition / off capable, mechanically-held transfer switch.

E. Control panel shall be micro-processor based.

2.2 MANUAL TRANSFER SWITCH

A. Acceptable Manufacturers:

1. ASCO 300 Series
2. Russelectric RMT Series
3. ABB Zenith ZTG Series
4. Cummins OTPC Series
5. Generac W Series
6. Kohler KCS Series

B. Description: NEMA ICS2; manual transfer switch.

C. Configuration: Manually-operated, three-position center-off transfer switch.

D. Engine start switch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work.

B. Verify field measurements are as instructed by the manufacturer.

C. Verify that required utilities are available, in proper location, and ready for use.

D. Beginning of installation means acceptance of existing conditions.

3.2 CONTROL AND SIGNAL CABLING

A. Provide control and signal cabling per manufacturer recommendations for the following systems components:

1. Remote annunciator.
2. Elevator controller. Provide wiring to elevator controller for emergency source mode and emergency to normal pre-signal.
3. Generator start signal. The generator start signal cabling for the following transfer switches shall be fire protected for a minimum of 2 hours using an approved method:

a. Emergency, optional standby transfer switches
b. Approved Methods:

1) Raceway or cable encased in a minimum of 2 inches of concrete cover.
2) Listed fire resistive raceway / cable system.
3) Raceway / cable is protected by a listed electrical circuit protective system.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

END OF SECTION

SECTION 311000

SITE CLEARING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Protecting existing trees and vegetation to remain, including temporary fencing for trees in close proximity to construction operations.
2. Removing existing trees and vegetation indicated to be removed.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above and below grade site improvements.
6. Disconnecting, capping or sealing of utilities as required.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 312000 – EARTH MOVING for soil materials, excavating, backfilling, and site grading and removal of site utilities.
2. Section 312500 – EROSION AND SEDIMENATION CONTROLS for required erosion and sedimentation control measures.

1.3 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2

inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain the User Agency's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Photographs sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Record drawings, according to Section 017700 - CONTRACT CLOSEOUT identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 PROJECT CONDITIONS

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

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

B. Salvable Improvements: Carefully remove items indicated to be salvaged and store on User Agency's premises where indicated.

C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

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

E. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing improvements indicated to remain in place or outside of the limit of work. Protect improvements on adjoining properties and on User Agency's property.

1. Restore improvements damaged by Contractor's clearing activities to their original condition, at no additional expense to the Commonwealth.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PREPARATION

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

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

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

1. Restore damaged improvements to their original condition, as acceptable to the DMH Project Manager.

3.2 TREE PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within fenced area.
2. Do not permit vehicles, equipment, or foot traffic within fenced area.
3. Maintain fenced area free of weeds and trash.
4. Except as otherwise directed, cutting and trimming of existing trees will not be permitted.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.
2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
4. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Designer.

1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
2. Replace trees that cannot be repaired and restored to full-growth status, as determined by the Designer.

3.3 UTILITIES

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

1. Arrange with utility companies to shut off indicated utilities.

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

1. Notify the DMH Project Manager not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without the DMH Project Manager's written permission.

C. Removal of underground utilities is included in Section 312000 – EARTH MOVING.

D. Removal of underground utilities is included in Division 2 Sections covering site utilities.

3.4 CLEARING AND GRUBBING

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

1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
4. Use only hand methods for grubbing within tree protection zone.
5. Chip removed tree branches and dispose of off-site.

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

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

3.5 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust or contamination by air-borne weed seed.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within tree protection zones.

3.6 EXCESS TOPSOIL

A. Topsoil that has been stripped and stockpiled, but is not needed after the completion of all final topsoil spreading and grassing, shall be stockpiled on site in a location to be approved by the User Agency and shall remain the property of the Commonwealth.

3.7 SITE IMPROVEMENTS

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

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

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.8 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off the User Agency's property.

1. Burning on site is prohibited.
2. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION

SECTION 312000

EARTH MOVING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Preparing subgrades for buildings, structures and landscaping.
2. Excavating and backfilling for buildings and structures.
3. Removal of underground utilities as applicable.
4. Drainage course for slabs-on-grade.
5. Subbase course for concrete pavements.
6. Subbase and base course for asphalt paving.
7. Subsurface drainage backfill for walls and trenches.
8. Excavating and backfilling for utility trenches.
9. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.
10. Coordination with maintenance of safe path of travel for the public.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 033000 - CAST-IN-PLACE CONCRETE for granular course if placed over vapor retarder and beneath the slab-on-grade.
2. Section 311000 - SITE CLEARING for site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements.
3. Section 312319 - DEWATERING for dewatering of trenches and excavations.
4. Section 312500 - EROSION AND SEDIMENTATION CONTROLS for temporary erosion and sedimentation control measures.

5. Section 315000 - EXCAVATION SUPPORT AND PROTECTION for shoring and bracing.
6. Division 02, 22, 23, and 26 Sections for installing underground mechanical and electrical utilities and buried mechanical and electrical structures.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and 12-inches over pipe in a trench including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench to approximately the gravel subbase layer.

B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.

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

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

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

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

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

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

H. Fill (Historic Fill): In-situ material known as Fill, also known as historic fill or miscellaneous fill, is defined as a mixture of soil and other materials which have been located in the area through man-made processes primarily for the purpose of grading, backfilling or filling in low areas. Material commonly associated with historic fill includes, but are not limited to glass, brick, ash, wood fragments and other similar granular materials. Historic fill shall not include boulders, ledge, consolidated rock, asphalt, concrete, railroad timbers, rail, cobblestones or any other abandoned building materials which would preclude the disposal of the urban fill as daily cover at a landfill. Material containing less than 10%, by volume, solid waste/debris, as determined by the Designer, shall be classified as historic fill. Material that contains 10% or more solid waste/debris by volume, as determined by the Designer, shall be classified as solid waste.

I. Obstructions: Parts of old foundations and other structures, including but not limited to, granite blocks, mass concrete, steel, former and existing utilities, concrete foundations, railroad ties, cobblestones, flood slabs, wood piles and other obstructions which may interfere with new foundation or utility locations and require removal shall be classified as obstructions.

J. Soil (Natural Soils): Soil, otherwise known as natural soil, is defined for the purposes of the Contract as unconsolidated sand, gravel, silt and clay, and the organic material which has become part of the unconsolidated soil matrix.

K. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted.

L. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

M. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

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

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

1.4 SUBMITTALS

A. Product Data: For the following:

1. Each type of plastic warning tape.
2. Geotextile.
3. Controlled low-strength material, including design mixture.

B. Material Test Reports: From a qualified testing agency for each on-site and imported fill soil material proposed for fill and backfill for review by the Engineer at least one (1) week prior to use of the material indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487.
2. Modified Proctor laboratory compaction curve according to ASTM D 1557.
3. Grain size analysis performed in accordance with ASTM D6913 or ASTMD7928 depending on the soil gradation

During Construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the Engineer before placing the next lift or constructing foundations or structures.

C. Qualifications for Approving Source: Prior to earthwork operations, submit the qualifications of the persons or Agency approving the source of supply of materials and control testing and inspection.

D. Earthwork Operations: Submit, prior to the excavation of earthwork activities, a plan describing the earthwork operations including the frequency and locations of tests and inspections. No work shall be performed until this plan has been approved by the Designer.

E. Supply and Control Inspection Results: Submit the results of all sources of supply and control inspections and tests. Submittals reviewed beyond the second rejection (or required submittal) shall be provided at no cost to the Owner and shall be reviewed by the Designer at the Contractor's expense. No work shall be performed until the Engineer has approved the source of supply.

F. Material Handling: At least two weeks prior to the start of any excavation activity submit, in writing, the following for review and shall not start excavation activity until the entire submittal is acceptable to the Engineer.

1. Description of the method of dewatering excavated material and control of effluent water quality.
2. Identification of a licensed hauler and disposal facility for possible vacuum collection, trucking and disposal of contaminated aqueous liquids.
3. Locations and methods of excavating, handling, and stockpiling (if applicable) excavated material, including drainage, as specified in this Section. Describe methods to keep materials from various sources separated during stockpiling operations (if applicable).

G. Import Backfill Materials Certification: A certification statement and analytical results shall accompany each physical sample of earth materials to be imported onto the site, including but not limited to loam, bedding sand, gravel sub-base, common fill and structural backfill. At a minimum the certification shall state the point of origin and that the material is free of contaminants. The certification shall include representative sample analysis from each point of origin of backfill to be used on the site. The sample(s) shall be analyzed by a certified laboratory for total metals (MCP 14 metals), volatile organic compounds (EPA Method 8260), semi-volatile organic compounds (EPA Method 8270), petroleum hydrocarbons (EPA Method 8100), and Total PCBs and pesticides (EPA Method 8081 and 8082). On-site soils defined as suitable for reuse can be used as backfill without providing the certification required above.

H. Submit additional geotechnical and analytical test data and certifications for every 1000 cubic yards of material imported or reused on-site or anytime consistency of material changes in the opinion of the Designer. Submit associated chemical laboratory data on the imported materials throughout the course of the Work, if requested by the Designer, to evaluate the consistency of the source or process, at no additional cost to the Owner.

I. Pre-excavation Photographs and Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused

by earthwork operations. Submit before earthwork begins. Maintain catalog of up-to-date photographs at the site.

J. Plan to Maintain Safe Path of Travel: Submit plans for maintaining safe paths of travel for the general public during the entire project, including requirement for police details of necessary.

1.5 PROJECT CONDITIONS

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

1. Notify the DMH Project Manager not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without the DMH Project Manager's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

C. Contractor shall perform as many additional exploratory excavations as necessary to verify subsurface conditions and groundwater levels at time of construction.

1.6 QUALITY ASSURANCE

A. The DMH reserves the right to perform inspections and testing at any time during the execution of work.

B. When rework or replacement of soils are required to achieve compaction, DMH may conduct confirmatory testing.

1.7 QUALITY CONTROL

A. The Contractor shall assume full responsibility for control inspection and testing and give sufficient notice to the Designer to permit the witnessing of the inspections or tests.

B. The contractor shall engage a qualified, independent testing agency to perform quality control testing and inspections.

C. The Designer may require the Contractor to perform additional tests to determine compliance with these specifications.

D. Source of Supply: No earthwork materials will be accepted on the jobsite without written approval from the Engineer. The Contractor shall perform sufficient tests and inspections necessary to determine the acceptability of the source of supply. A Certified Testing and

Inspection Agency shall be used to perform such test and inspections. The qualifications of the person or agency performing these tests and inspections shall be forwarded to the Designer for approval. Subsequent to this approval, test results showing the acceptability of the source of supply, shall be forwarded to the Designer for approval.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

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

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil containing oil or hazardous materials at concentrations (per 1.5.G of this Specification) exceeding the MCP Reportable Concentrations applicable to the location of the work. Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of ASTM D 2940 for sub-bases.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of ASTM D 2940 for bases.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of ASTM D 2940 for sub-bases; except material specified as Free-Draining Engineered Fill shall not contain more than 5 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially well graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of ASTM D 2940 for bases or sub-bases; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; meeting the requirements of ASTM D 448 for coarse-aggregate grading Size 57.

I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; meeting the requirements of ASTM D 448 for coarse-aggregate grading Size 67.

J. Sand: Natural or manufactured sand; meeting the requirements of ASTM C 33for fine aggregate.

K. Surface Fill Near Buildings: MassDOT M1.08.0 - Impervious Soil Borrow.

L. Ordinary Fill: Satisfactory soil with 20 to 100 percent passing a No. 4 sieve, 5 to 50 percent passing a No. 50 sieve, and 0 to 20 percent passing a No. 400 sieve.

M. Controlled Density Fill (CDF): Controlled density fill shall consist of a cementitious hard excavatable mixture of aggregate, Portland Cement, air entraining admixtures and water. The material shall be of the type specified in Massachusetts Highway Department 1995 Standard Specifications for Highway and Bridges, Type 2E. Controlled density fill shall be used as trench backfill material around structures (not including manholes and catch basins) between the top of the crushed stone layer and the top of the structure. Controlled density fill shall also be used to fill abandoned utilities and around the excavation support systems as directed by the Designer.

2.2 GEOTEXTILES

A. Subsurface Drainage Geotextile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 157 lbf; ASTM D 4632.
3. Sewn Seam Strength: 142 lbf; ASTM D 4632.
4. Tear Strength: 56 lbf; ASTM D 4533.
5. Puncture Strength: 56 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 40 sieve, maximum; ASTM D 4751.
7. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M 288.
2. Grab Tensile Strength: 247 lbf; ASTM D 4632.
3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
4. Tear Strength: 90 lbf; ASTM D 4533.
5. Puncture Strength: 90 lbf; ASTM D 4833.
6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.3 ACCESSORIES

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

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

PART 3 - EXECUTION

3.1 PREPARATION

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

B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Section 311000 - SITE CLEARING.

C. Protect and maintain erosion and sedimentation controls, which are specified in Section 311000 - SITE CLEARING and Section 312500 - EROSION AND SEDIMENTATION CONTROLS, during earthwork operations.

D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.2 DEWATERING

A. Comply with requirements of Section 312319 – DEWATERING.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area. Dispose of contaminated water in accordance with regulations of authorities having jurisdiction.

C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

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

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

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

B. Contractor shall remove obstructions encountered within 2 feet of subgrades for structures, walks, pavements, or utilities.

C. Follow a construction procedure that permits visual identification of firm stable ground. In the event that groundwater is encountered, the Designer may require that the size of the open excavation be limited to that which can be handled by the Contractor's chosen method of dewatering and allow visual observation of the bottom and backfill placement in the dry.

D. Exercise extreme caution while excavating so as not to damage or disturb other appurtenances, utilities, structures and buildings not designated for removal. To avoid adverse impacts on existing buildings on footings, excavation should not intrude the “zone of influence” beneath existing building footings. The Zone of Influence is defined as the section below the footing extending outward and downward at a slope of one horizontal to one vertical (1H:1V) from 1 foot beyond the outside edges of the existing footings. Any damage caused by the Contractor’s

operations shall be immediately repaired with materials and methods approved by the Engineer at no cost to the DMH.

E. If unsuitable bearing materials are encountered at required subgrade elevations consult the Designer for direction. The extent of over-excavation of unsuitable bearing materials and the type of material used to backfill over-excavations will be determined by the Designer.

3.5 EXCAVATION FOR STRUCTURES

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

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. If material at bottom of excavation is disturbed, recompaction shall be required.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

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

3.7 EXCAVATION FOR UTILITY TRENCHES

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

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

B. Excavate trenches to uniform widths to provide 12 inches on each side of pipe or conduit.

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

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

D. Temporary Sheeting and Shoring of Trenches:

1. Comply with requirements of Section 315000 – EXCAVATION SUPPORT AND PROTECTION.

2. When conduit and foundations are being installed in a trench or hole, the Contractor shall furnish, place, and maintain such sheeting and shoring as may be required to support the sides of such excavations and adjacent structures.

3. Should the Contractor be permitted to slope the sides of such excavations so that sheeting, shoring, or bracing is not necessary to prevent cave-ins or slides along the excavation, such additional excavation and backfill required because of flattening of slopes shall be done at no additional cost to the DMH.

3.8 SUBGRADE INSPECTION

A. Notify Designer when excavations have reached required subgrade.

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

C. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. In areas where it is infeasible to have large construction equipment, proof rolling shall be performed using lighter compaction equipment such as a walk-behind trench roller as well as evaluation of the subgrade with a hand probe.
4. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Designer, and replace with compacted backfill or fill as directed.

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

3.9 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi may be used when approved by Designer.

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

3.10 STORAGE OF SOIL MATERIALS

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

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
2. Stockpile soil materials in a location, acceptable to the DMH Project Manager that will preclude having to relocate stockpiled soil materials that would otherwise delay or impact the Work.

3.11 BACKFILL

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

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

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

3.12 UTILITY TRENCH BACKFILL

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

B. Backfill trenches excavated under footings and within 18 inches of bottom of footings with Engineered Fill; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 033000 - CAST-IN-PLACE CONCRETE.

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

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

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

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

F. Place and compact final backfill of satisfactory soil to final subgrade elevation.

G. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been satisfactorily completed, the Contractor, as required by the Designer, shall make special leakage tests of the structures. After the satisfactory completion of leakage tests and the satisfactory completion of any other required work in connection with the structures, the backfilling around the structures shall proceed using Controlled Density Fill (CDF) material. Symmetrical backfill loading shall be maintained. Special care shall be taken to prevent any wedging action or eccentric loading upon or against the structures.

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

3.13 SOIL FILL

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

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

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.

3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

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

3.14 SOIL MOISTURE CONTROL

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

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

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.

B. Crushed stone shall be wrapped in filter fabric, placed in maximum 6-inch thick layers, loose measure, and compacted with a minimum of four passes of a vibratory plate or roller compactor. The crushed stone shall be uniformly blended.

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

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

1. Under structures, building slabs, steps, and pavements, compact each layer of backfill or fill soil material at 95 percent; and areas within 10 feet of structures, building slabs, steps, and pavements at 92 percent.
2. Under walkways, compact each layer of backfill or fill soil material at 92 percent.
3. Under lawn or unpaved areas, compact each layer of backfill or fill soil material percent to a firm and unyielding condition.
4. For utility trenches, compact each layer of initial and final backfill soil material at 92 percent.
5. For embankments, compact each layer at minimum 92 percent minimum.

3.16 GRADING

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

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

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

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17 SUBSURFACE DRAINAGE

A. Subdrainage Pipe: Specified in Division 2 Section "Subdrainage."

B. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum of 12 inches of filter material, placed in compacted layers 6 inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer to a firm an unyielding condition.

C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade, in compacted layers 6 inches thick. Overlay drainage backfill with 1 layer of subsurface drainage geotextile, overlapping sides and ends at least 6 inches.

1. Compact each filter material layer to a firm an unyielding condition.
2. Place and compact impervious fill over drainage backfill in 6-inch-thick compacted layers to final subgrade.

3.18 SUBBASE AND BASE COURSES

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

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

1. Install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place base course material over subbase course under hot-mix asphalt pavement.
3. Shape subbase and base course to required crown elevations and cross-slope grades.
4. Place subbase and base course 6 inches or less in compacted thickness in a single layer.
5. Place subbase and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
6. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

C. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.19 DRAINAGE COURSE

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

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.20 FIELD QUALITY CONTROL

A. Independent Testing Agency: Cooperate with the Independent Testing Agency engaged by DMH for field quality control activities for the Work of this Section. Refer also to Section 014325 - TESTING AGENCY SERVICES.

B. Cooperate with field quality control personnel.

C. Additional inspections and retesting of materials which fail to comply with specified material and installation requirements shall be performed at Contractor's expense.

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

E. Footing Subgrade: Footing subgrades shall be proof compacted as described above.

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

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

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

3.21 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Designer; reshape and recompact.

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

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

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off the User Agency's property in accordance with all applicable local, state and federal regulations.

END OF SECTION

SECTION 312319

DEWATERING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Construction dewatering.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 312000 - EARTH MOVING for excavating, backfilling, site grading, and for site utilities.
2. Section 315000 - EXCAVATION SUPPORT AND PROTECTION for shoring, bracing, and sheet piling of excavations.
3. Section 3125000 – EROSION AND SEDIMENTATION CONTROLS for temporary erosion and sedimentation controls.

1.3 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain temporary dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

1. Delegated Design: Design dewatering system, including comprehensive engineering analysis by a qualified Professional Engineer registered in the Commonwealth of

Massachusetts, using performance requirements and design criteria indicated. All costs for delegated design shall be included in the bid price for the Work of this Section.

2. Test groundwater for oil or hazardous materials at start of construction operations. Provide on-site treatment system to treat all water removed from excavations, except water that is re-infiltrated to the ground on site, in a manner that does not result in negative on- or off-site impacts and in compliance with applicable regulations.
3. Water removed from excavations shall be reinfiltrated to the ground if feasible. If reinfiltration is not feasible, treated water shall be directly or indirectly discharged to a surface water in accordance with a National Pollutant Discharge Elimination System (NPDES) permit issued by the U.S. Environmental Protection Agency (EPA). If neither reinfiltration nor surface water discharge is feasible, treated water shall be discharged to the Massachusetts Water Resources Authority (MWRA) or local sewer system in accordance with the appropriate permit and regulations. In no case shall dewatering flows be directly or indirectly released to surface waters or storm drains prior to settling and appropriate additional treatment.
4. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
5. Prevent surface water from entering excavations by grading, dikes, or other means.
6. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
7. Remove dewatering system when no longer required for construction.

1.4 SUBMITTALS

A. Shop Drawings for dewatering system: Show arrangement, locations, and details of wells and well points; locations of risers, headers, filters, pumps, power units, and discharge lines; and means of discharge, control of sediment, and disposal of water.

1. Include layouts of piezometers and flow-measuring devices for monitoring performance of dewatering system.
2. Include a written Plan for dewatering operations including control procedures to be adopted if dewatering problems arise.

B. Delegated-Design Submittal: For dewatering system indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer licensed in the Commonwealth of Massachusetts responsible for their preparation.

C. Qualification Data: For qualified Installer

D. Field quality-control reports.

E. Other Informational Submittals:

1. Photographs: Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by dewatering operations.

1.5 QUALITY ASSURANCE

A. Employ the services of a Dewatering Professional and a Massachusetts Registered Professional Engineer having the following qualifications:
   1. The Massachusetts Registered Professional Civil Engineer shall have completed the design of at least five (5) successful dewatering projects of equal size and complexity and with equal systems within the last five (5) years consisting of deep wells, well points, vacuum well points, and sump pumping for projects of similar size, type, and complexity with the temporary support of excavation systems proposed by the Contractor including, but not limited to, trench boxes, soldier pile and lagging, timber sheeting support and secant pile support of excavation systems.
   2. The dewatering systems installer supervisor shall have a minimum of 5 years' experience in installation of well points, deep wells, recharge systems, or equal systems.
   3. The Dewatering Professional responsible for day to day operation of the system shall have the following minimum qualifications:

      a. Completion of at least 5 successful dewatering projects of equal size and complexity with equal systems within the last five (5) years consisting of system operation and troubleshooting, collection of readings, maintenance of logs and other required documents, collection of samples, coordination of analysis of samples, and compliance with reporting requirements during pumping for heavy Civil projects of similar size, type, and complexity in urban areas.

      b. Valid certification from the Massachusetts Department of Environmental Protection (DEP) to operate the proposed treatment system..

B. Regulatory Requirements: Comply with governing Massachusetts Department of Environmental Protection (MassDEP) and U.S. Environmental Protection Agency and other applicable regulations and permitting and notification requirements before beginning dewatering. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

   1. Review methods and procedures related to dewatering including, but not limited to, the following:

      a. Inspection and discussion of condition of site to be dewatered including coordination with temporary erosion control measures and temporary controls and protections.
      b. Geotechnical report.
      c. Proposed site clearing and excavations.
      d. Existing utilities and subsurface conditions.
      e. Coordination for interruption, shutoff, capping, and continuation of utility services.
      f. Construction schedule. Verify availability of Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
      g. Testing and monitoring of dewatering system.
      h. Control of dewatering equipment during non-work hours.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by DMH or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify DMH Project Manager no fewer than two days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without DMH Project Manager's written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. DMH will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
2. The geotechnical report is referenced elsewhere in the Project Manual.

C. Survey Work: Engage a qualified land surveyor or professional engineer licensed in the Commonwealth of Massachusetts to survey adjacent existing buildings, structures, and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Designer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide groundwater monitoring wells in accordance with the submitted dewatering plan or as specified.

B. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.

C. Provide sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.

D. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.

E. Provide and store auxiliary dewatering equipment, consisting of pumps and hoses on the site in the event of breakdown, at least one (1) pump for every five (5) used.

F. Provide dewatering equipment, including an appropriately sized settling tank, and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.

G. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.

H. Provide cement grout having a water cement ratio of 1 to 1 by volume.

PART 3 - EXECUTION

3.1 PREPARATION

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

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install and operate dewatering system to control groundwater levels as required for the proposed constructions.

C. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

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

D. Provide temporary grading to facilitate dewatering and control of surface water.

E. Monitor dewatering systems continuously.

F. Promptly repair damages to adjacent facilities caused by dewatering.

G. Protect and maintain temporary erosion and sedimentation controls, which are specified in Section 312500 - EROSION AND SEDIMENTATION CONTROLS during dewatering operations.

3.2 INSTALLATION

A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Space well points or wells at intervals required to provide sufficient dewatering.
2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

B. Before excavating below ground-water level, place system into operation to lower water to specified levels. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

C. Provide an adequate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.

D. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.

1. Maintain piezometric water level a minimum of 24 inches below excavation subgrade.

E. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

F. Provide standby equipment on site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails. If dewatering requirements are not satisfied due to inadequacy or failure of dewatering system, restore damaged structures and foundation soils at no additional expense to DMH.

G. Damages: Promptly repair damages to adjacent facilities caused by dewatering operations.

3.3 FIELD QUALITY CONTROL

A. Observation Wells: Provide, take measurements, and maintain at least the minimum number of observation wells or piezometers indicated; additional observation wells may be required by authorities having jurisdiction.

1. Observe and record daily elevation of ground water and piezometric water levels in observation wells.
2. Repair or replace, within 24 hours, observation wells that become inactive, damaged, or destroyed. In areas where observation wells are not functioning properly, suspend

construction activities until reliable observations can be made. Add or remove water from observation-well risers to demonstrate that observation wells are functioning properly.

3. Fill observation wells, remove piezometers, and fill holes when dewatering is completed.

B. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

3.4 REMOVAL

A. Do not remove dewatering system without written approval from the Engineer.

B. All dewatering wells shall be abandoned upon completion of the work, and completely backfilled with cement grout.

END OF SECTION

SECTION 312500

EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Control measures to prevent all erosion, siltation and sedimentation of wetlands, waterways, construction areas, adjacent areas and off-site areas.
2. Control measures shall be accomplished adjacent to or in the following work areas:
   a. Soil stockpiles and on-site storage and staging areas.
   b. Cut and fill slopes and other stripped and graded areas.
   c. Constructed and existing swales and ditches.
   d. Surface water bodies, including retention and detention ponds.
   e. At edge of wetlands areas, if applicable, as shown on Drawings.
3. Additional means of protection shall be provided by the Contractor as required for continued or unforeseen erosion problems, at no additional cost to DMH.
4. Periodic maintenance of all sediment control structures shall be provided to ensure intended purpose is accomplished. Sediment control measures shall be in working condition at the end of each day.
5. After any significant rainfall, sediment control structures shall be inspected for integrity. Any damaged device shall be corrected immediately.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 311000 – SITE CLEARING for protection of existing tress and other vegetation to remain.
2. Section 312000 – EARTH MOVING for soil materials, excavating, backfilling, and site grading and removal of site utilities.

1.3 QUALITY ASSURANCE

A. When applicable, comply with the requirements of Stormwater Pollution Prevention Plan prepared for the NPDES permit, which are incorporated herein by reference, and all other applicable requirements of governing authorities having jurisdiction. The specifications and drawings are not represented as being comprehensive, but rather convey the intent to provide complete slope protection and erosion control for both the project site and adjacent property.

1. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to a sediment and erosion control plan specific to the site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
2. Regulatory Order of Conditions ((Attach to the end of this Section, when applicable))

B. Erosion control measures shall be established at the beginning of construction and maintained during the entire period of construction. On-site areas which are subject to severe erosion, and off-site areas which are especially vulnerable to damage from erosion and/or sedimentation, are to be identified and receive special attention.

C. All land-disturbing activities are to be planned and conducted to minimize the size of the area to be exposed at any one time, and the length of time of exposure.

D. Surface water runoff originating upgrade of exposed areas should be controlled to reduce erosion and sediment loss during the period of exposure.

E. When the increase in the peak rates and velocity of storm water runoff resulting from a land-disturbing activity is sufficient to cause accelerated erosion of the receiving stream bed, provide measures to control both the velocity and rate of release so as to minimize accelerated erosion and increased sedimentation of the stream.

F. All land-disturbing activities are to be planned and conducted so as to minimize off-site sedimentation damage.

G. The Contractor is responsible for cleaning out and disposing of all sediment once the storage capacity of the sediment facility is reduced by one-half.

H. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

I. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Straw Bales: Wire or nylon bound bales of straw, oriented around sides, rather than over and under.

B. Stakes: Stakes for bales shall be one of the following materials: Wood stakes of sound hardwood 2 by 2 inches in size or steel reinforcing bars of at least No. 4 size. Lengths shall be approximately three feet.

C. Siltation Fence: Fabricated or prefabricated unit consisting of the following filter fabric properties:

1.	Grab Tensile Strength	90	ASTM D1682
2.	Elongation at Failure (%)	50	ASTM D1682
3.	Mullen Burst Strength (PSI)	190	ASTM D3786
4.	Puncture Strength (lbs)	70	ASTM D751 (modified)
5.	Slurry Flow Rate (gal/min/sf)	0.5	Virginia DOT VTM-51
6.	Equivalent Opening Size	40-80	US Std Sieve CW-02215
7.	Ultraviolet Radiation Stability (%)	90	ASTM G26

D. Fencing: Steel posts shall be standard 6 foot long metal stamped drive stakes commonly used to support snow fences. Fencing shall be new four foot height wood lath snow fencing. Provide suitable steel staples or heavy nylon cord for securing filter cloth to support system.

E. Protective Measures: As temporary coverings on ground areas subject to erosion, provide one of the following protective measures, and as directed by the Designer with concurrence of the DMH Project Manager:

1. Hay or straw temporary mulch, 100 pounds per 1,000 square feet.
2. Wood fiber cellulose temporary mulch, 35 pounds per 1,000 square feet.
3. Tackafier for anchoring mulch or straw shall be a non-petroleum based liquid bonding agent specifically made for anchoring hay or straw.
4. Provide natural (jute, wood excelsior) or man-made (glass fiber) covering with suitable staples or anchors to secure to ground surface. Note that wire stapes and non-biodegradable coverings shall not be used for any area that will be mown turf.
5. Temporary vegetative cover for graded areas shall be undamaged, air dry threshed straw or hay free of undesirable weed seed.

PART 3 - EXECUTION

3.1 STRAW BALE BARRIERS

A. Excavation shall be to the width of the bale and the length of the proposed barrier to a minimum depth of 4 inches.

B. Bales shall be placed in a single row, lengthwise on proposed line, with ends of adjacent bales tightly abutting one another. In swales and ditches the barrier shall extend to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale.

C. Staking shall be accomplished to securely anchor bales by driving at least two stakes or rebars through each bale to a minimum depth of 18 inches.

D. The gaps between bales shall be filled by wedging straw in the gaps to prevent water from escaping between the bales.

E. The excavated soil shall be backfilled against the barrier. Backfill shall conform to ground level on the downhill side and shall be built up to 4 inches on the uphill side. Loose straw shall then be scattered over the area immediately uphill from a straw barrier.

F. Inspection shall be frequent and repair or replacement shall be made promptly as needed.

3.2 STABILIZED CONSTRUCTION ENTRANCE AND STONE BERMS

A. Stone size: Use ASTM designation C-33, size No. 2 (1-1/2” to 2-1/2”). Use crushed stone.

B. Length: As effective, but not less than 50 feet.

C. Thickness: Not less than eight inches.

D. Width: Not less than full width of all points on ingress or egress, but not less than 25 feet.

E. Washing: When necessary, wheels shall be cleaned to remove sediment prior to entrance onto public right-of-way. When washing is required, it shall be done on an area stabilized with crushed stone which drains into an approved sediment trap or sediment basin. All sediment shall be prevented from entering any storm drain, ditch, or watercourse through the use of sand bags, gravel boards or other approved methods.

F. Maintenance: The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-or-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spoiled, dropped, washed or tracked onto public rights-of-way must be removed immediately.

G. Place crushed stone berms in locations required and as directed. Berms shall have side slopes of 1:3 or less.

H. Inspect stone berms periodically and replace and/or regrade crushed stone as required.

3.3 SILT FENCING

A. Excavate a 6 inch trench along the upstream side of the desired fence location.

B. Drive fence posts a minimum of 1'-6" into the ground. Install fence, well-staked at maximum eight foot intervals in locations as shown on Drawings. Secure fabric to fence and bury fabric end within the six inch deep trench cut.

C. Lay lower 12 inches of silt fence into the trench, 6 inches deep and 6 inches wide. Backfill trench and compact. Overlap joints in fabric at post to prevent leakage of silt at seam.

3.4 EROSION CONTROL GRASSING

A. Grassing shall be applied according to State of Massachusetts Highway Department Standard Specifications.

3.5 INLET PROTECTION

A. Install silt fence or straw bales around inlet as specified herein.

3.6 DUST CONTROL

A. Throughout the construction period the Contractor shall carry on an active program for the control of fugitive dust within all site construction zones, or areas disturbed as a result of construction. Control methods shall include the following: Apply calcium chloride at a uniform rate of one and one-half (1 ½) pounds per square yard in areas subject to blowing. For emergency control of dust apply water to affected areas. The source of supply and the method of application for water are the responsibility of the contractor.

B. The frequency and methods of application for fugitive dust control shall be as directed by the Designer with concurrence by the DMH Project Manager.

3.7 TEMPORARY PROTECTIVE COVERINGS (AFTER GROWING SEASON)

A. Place temporary covering for erosion and sedimentation control on all areas that have been graded and left exposed after October 30. Contractor shall have the choice to use either or both of the methods described herein.

B. Hay or straw shall be anchored in-place by one of the following methods and as approved by the Designer with concurrence by the DMH Project Manager: Mechanical "crimping" with a tractor drawn device specifically devised to cut mulch into top two inches of soil surface or application of non-petroleum based liquid tackifier, applied at a rate and in accordance with manufacturer's instructions for specific mulch material utilized.

C. Placement of mesh or blanket matting and anchoring in place shall be in accordance with manufacturer's printed instructions.

D. Inspect protective coverings periodically and reset or replace materials as required.

END OF SECTION

SECTION 315000

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Temporary excavation support and protection systems.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 013200 - CONSTRUCTION PROGRESS DOCUMENTATION for recording preexisting conditions and excavation support and protection system progress.
2. Section 015000 - TEMPORARY FACILITIES AND CONTROLS for temporary utilities and support facilities.
3. Section 312000 - EARTH MOVING.
4. Section 312319 - DEWATERING for dewatering system for excavations.

1.3 PERFORMANCE REQUIREMENTS

A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure, superimposed construction loads, and loads from adjacent structures, roadways, and railways

1. Provide professional engineering services needed to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer registered in the Commonwealth of Massachusetts.
2. Prevent surface water from entering excavations by grading, dikes, or other means.

3. Install excavation support and protection systems without damaging existing buildings, pavements, and other improvements adjacent to excavation.
4. Provide vibration monitoring to prevent impacts on adjacent structures and utilities.

B. Consult official records of existing utilities, both surface and subsurface, and their connections to be fully informed on all existing conditions and limitations as they apply to this work and its relation to other construction work. Proceed with caution in areas of utility facilities. Expose them by hand excavation or by other methods acceptable to the utility owner. Protect existing utilities to remain within and adjacent to the work area in accordance with the requirements of authorities having jurisdiction over the same. The Contractor is responsible for any damage to utilities caused by the Contractor's operations and shall restore them to equal or better operation at no additional cost to the owner.

1.4 SUBMITTALS

A. Contractor submittals shall be acceptable to the Designer prior to undertaking the work. The Contractor shall forward submittals a minimum of 1 month in advance considering that resubmittals may be required.

B. Shop Drawings and Calculations: Prepared by or under the supervision of a qualified Structural Engineer registered in the Commonwealth of Massachusetts for excavation support and protection systems.

1. Include Shop Drawings signed and sealed by the qualified professional engineer licensed in the Commonwealth of Massachusetts responsible for their preparation.
2. Identify elements of the support that will not be left in place, as well as elements that will serve in a permanent capacity.
3. Provide all engineering calculations and design assumptions, considering all intermediate construction stages as well as final conditions. Include estimates of deflections under applied loads, material types, and capacities. The design shall consider the potential need for over-excavation to remove unsuitable materials below the planned bottom of excavation.

C. Provide a Work Plan demonstrating the means, methods, and sequencing of the work including but not limited to the following:

1. Provide overall plan layout of the system indicating wall types, and clearance from existing and proposed utilities, structure, and other obstructions. Indicate dimensions, material properties, locations, spacing and penetration depths of all member, and the locations and various types of lateral support elements.
2. Show the overall sequence of excavation and installation of bracing, if required.

D. Qualification Data: For installer and professional engineer.

E. Photographs or videotape, sufficiently detailed, of existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems.

1.5 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:

a. Geotechnical report.
b. Existing utilities and subsurface conditions.
c. Proposed excavations.
d. Proposed equipment.
e. Monitoring of excavation support and protection system.
f. Working area location and stability.
g. Coordination with waterproofing.
h. Abandonment or removal of excavation support and protection system.

1.6 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving occupied facilities unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

1. Notify DMH Project Manager no fewer than two days in advance of proposed interruption of utility.
2. Do not proceed with interruption of utility without DMH Project Manager's written permission.

B. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. DMH will not be responsible for interpretations or conclusions drawn from the data.

1. Make additional test borings and conduct other exploratory operations necessary for excavation support and protection.
2. The geotechnical report is referenced elsewhere in the Project Manual.

C. Survey Work: Engage a qualified land surveyor or professional engineer licensed in the Commonwealth of Massachusetts to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Designer if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.

C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.

D. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.

E. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

F. Timber Piling: ASTM D 25, species listed in AWPA C3, pressure-treated in accordance with AWPA C3.

G. Seven Wire Strand: ASTM A 416, Grade 250 or 270., uncoated seven-wire, low-relaxation strand.

H. Grout: Suitable for service, minimum 4,000 psi.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

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

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Vibratory methods shall not be used to install elements of the excavation support system within 20 feet of existing structures.

F. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

1. Damage to adjacent structures or facilities shall be repaired by the Contractor at his own cost and at no cost to DMH.

3.2 SOLDIER BEAMS AND LAGGING

A. Install steel soldier beams before starting excavation. Space soldier beams at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

B. Install wales horizontally at spacings indicated on the approved shop drawings and secure to soldier beams.

3.3 SHEET PILING

A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Limit vertical offset of adjacent sheet piling to 60 inches. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

3.4 TIEBACKS

A. Use of tiebacks is subject to approval of the DMH

B. Tiebacks: Drill for, install, grout, and tension tiebacks into position. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.

1. Test loading shall be observed by a qualified professional engineer licensed in the Commonwealth of Massachusetts responsible for design of excavation support and protection system.
2. Maintain tiebacks in place until permanent construction is able to withstand lateral earth and hydrostatic pressures.
3. Inspect tiebacks periodically to confirm anchors exhibit no movement.

3.5 BRACING

A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.

1. Do not place bracing where it will be cast into or included in permanent concrete work, unless otherwise approved by Designer.
2. Install internal bracing, if required, to prevent spreading or distortion of braced frames.
3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.6 REMOVAL AND REPAIRS

A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.

1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlaying construction and abandon remainder.
2. Fill voids immediately with approved backfill compacted to density specified in Section 312000 - EARTH MOVING.
3. Repair or replace, as approved by Designer, adjacent work damaged or displaced by removing excavation support and protection systems.

END OF SECTION

SECTION 321313

CONCRETE PAVING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Cement concrete paving, including walkways, ramps and accessible curb cuts.
2. Concrete base for unit pavers.
3. Pavement-marking paint.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 033000 - CAST-IN-PLACE CONCRETE for general building applications of concrete.
2. Section 312000 - EARTH MOVING for subgrade preparation, grading, and subbase course.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Qualification Data: For manufacturer and testing agency.

D. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

E. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:

1. Cementitious materials.
2. Steel reinforcement and reinforcement accessories.
3. Fiber reinforcement.
4. Admixtures.
5. Curing compounds.
6. Applied finish materials.
7. Joint fillers.

F. Field quality-control test reports.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of the local authorities having jurisdiction for concrete asphalt paving work.

1. Comply with requirements of the Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board (MAAB). If these requirements cannot be met with the grades and slopes indicated on the plans, notify the Designer immediately.
2. Comply with requirements of the local authorities having jurisdiction concerning the location and construction of accessible curb cuts.

C. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

D. Mockups: Cast mockups of full-size sections of concrete pavement to demonstrate typical joints, surface finish, texture, color, and standard of workmanship.

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Designer.
2. Notify Designer seven days in advance of dates and times when mockups will be constructed.
3. Obtain Designer's approval of mockups before starting construction.

4. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed pavement.
5. Demolish and remove approved mockups from the site when directed by Designer.
6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1. Before submitting design mixtures, review concrete pavement mixture design and examine procedures for ensuring quality of concrete materials and concrete pavement construction practices. Require representatives, including the following, of each entity directly concerned with concrete pavement, to attend conference:

a. Contractor's superintendent.
b. Independent testing agency responsible for concrete design mixtures.
c. Ready-mix concrete producer.
d. Concrete pavement subcontractor.
e. DMH Resident Engineer.

1.5 ADA AND MAAB COMPLIANCE

A. Comply with American with Disabilities Act (ADA) and the requirements of the Massachusetts Architectural Access Board (MAAB).

1. Slopes: Walkways as defined by Section 22.1 of 521 CMR shall be graded to a maximum of 4.5%. The cross-pitch (perpendicular to travel) for walkways and paths shall be constructed at 1.5%. The slopes of ramps and side slopes on handicap curb cuts as defined by Section 21.1 of 521 CMR shall be constructed at 7% maximum. Ramps as defined in Section 24.1 of 521 CMR shall be constructed to a maximum slope of 7%.
2. The Contractor is to assume that sidewalk grades will be verified and checked with a 2-foot long electronic ‘smart level’.
3. A 5’-0” minimum level, 1.5% pitch, area shall be provided at entrances to buildings. Puddling or ponding of water at the entrances will not be accepted.
4. The requirements specified hereinabove shall supercede the grades indicated on the Drawings. If these requirements cannot be met with the grades indicated on the Drawings, the Designer shall be notified immediately for direction.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Environmental Limitations: Do not apply concrete materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure.

C. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 55 degrees F for water-based materials, and not exceeding 95 degrees F.

PART 2 - PRODUCTS

2.1 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves with a radius 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces and contains no PCBs or other restricted chemicals.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497, flat sheet.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

D. Galvanized Reinforcing Bars: ASTM A 767/A 767M, Class II zinc coated, hot-dip galvanized after fabrication and bending; with ASTM A 615/A 615M, Grade 60 deformed bars.

E. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.

F. Plain Steel Wire: ASTM A 82, as drawn.

G. Deformed-Steel Wire: ASTM A 496.

H. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

I. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

J. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice."

K. Zinc Repair Material: ASTM A 780.

2.3 CONCRETE MATERIALS

A. Cementitious Material: Use one of the following cementitious materials, of the same type, brand, and source throughout the Project:

1. Portland Cement: ASTM C 150, Type I or II. Supplement with the following:

a. Fly Ash: ASTM C 618, Class C or F.
b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded. Provide aggregates from a single source.

C. Water: ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: ASTM C 494/C 494M, of type suitable for application, certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

2.4 FIBER REINFORCEMENT

A. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.

E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

F. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.

2.6 AUXILIARY MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

C. Pavement-Marking Paint: Acrylic/latex type, low VOC, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 45 minutes.

1. Color: As indicated.

D. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners, drainage slots on underside, and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length.

2.7 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, with the following properties:

1. Compressive Strength (28 Days): 3500 psi.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.
4. Air Content: 6 percent plus or minus 1.5 percent for 3/4-inch nominal maximum aggregate size.

B. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements as follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Ground Granulated Blast-Furnace Slag: 50 percent.
3. Combined Fly Ash or Pozzolan, and Ground Granulated Blast-Furnace Slag: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

D. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.

1. When air temperature is between 85 degrees F and 90 degrees F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For concrete mixes of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For concrete mixes larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixing time, quantity, and amount of water added.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

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

3.2 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.4 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, to match jointing of existing adjacent concrete pavement.

E. Edging: Tool edges of pavement and joints in concrete after initial floating with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Moisten subbase to provide a uniform dampened condition at time concrete is placed.

C. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

D. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

E. Screed pavement surfaces with a straightedge and strike off.

F. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

G. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 degrees F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 degrees F and not more than 80 degrees F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

3.6 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

C. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on pavement surface according to manufacturer's written instructions.

1. Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
2. After curing, lightly work surface with a steel wire brush or abrasive stone and water to expose nonslip aggregate.

3.7 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture-retaining-cover curing or curing compound, as follows:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.8 PAVEMENT TOLERANCES

A. Accessibility: Comply with requirements of Massachusetts Architectural Access Board and ADAAG requirements. Remove and replace paving that does not meet required tolerances, when measured with a 2 foot straightedge.

B. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/4 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

3.9 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Designer.

B. Allow concrete pavement to cure for 28 days and be dry before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.10 WHEEL STOPS

A. Securely attach wheel stops into pavement with not less than two galvanized steel dowels embedded in holes drilled or cast into wheel stops at one-quarter to one-third points. Firmly bond each dowel to wheel stop and to pavement. Securely install dowels into pavement and bond to wheel stop. Recess head of dowel beneath top of wheel stop.

3.11 FIELD QUALITY CONTROL

A. Independent Testing Agency: Cooperate with the Independent Testing Agency engaged by DMH for field quality control activities for the Work of this Section. Refer also to Section 014325 - TESTING AGENCY SERVICES.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least 1 composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 degrees F and below and when 80 degrees F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of three standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39/C 39M; test 1 specimen at 7 days and 2 specimens at 28 days.

    a. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to Designer, DMH Project Manager, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Designer but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Designer.

G. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.12 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Drill test cores, where directed by Designer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

SECTION 329200

TURF AND GRASSES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:

1. Seeding.
2. Sodding.
3. Topsoil.

B. Alternates: Not Applicable.

C. Items To Be Installed Only: Not Applicable.

D. Items To Be Furnished Only: Not Applicable.

E. Related Work: The following items are not included in this Section and will be performed under the designated Sections:

1. Section 311000 - SITE CLEARING for topsoil stripping and stockpiling.
2. Section 312000 - EARTH MOVING for excavation, filling and backfilling, and rough grading.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

C. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

D. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

1.4 SUBMITTALS

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

1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

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

1. Certification of each seed mixture for sod. Include identification of source and name and telephone number of supplier.

C. Qualification Data: For qualified landscape Installer.

D. Product Certificates: For soil amendments and fertilizers, from manufacturer.

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

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

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

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful turf establishment. Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Contractor’s Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

D. Topsoil Suitability: Report suitability of topsoil for turf growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory topsoil.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01.

1.6 DELIVERY, STORAGE, AND HANDLING

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

B. Sod: Harvest, deliver, store, and handle sod according to requirements in Turfgrass Producers International's (TPI) "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding."

1.7 PROJECT CONDITIONS

A. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from the date of Certificate of Agency Use and Occupancy.

1. Spring Planting: April 1 to May 31.
2. Fall Planting: August 15 to October 1.
3. Sod Placement: April 15 to November 1, provided that ground is not frozen.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit. Do not plant during inclement weather including but not limited to heavy rain, high winds, frost and similar conditions.

1.8 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Seeded Turf: 60 days from the date of Certificate of Agency Use and Occupancy. Guarantees or warranties that start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable.

    a. When full maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

2. Sodded Turf: 30 days from the date of Certificate of Agency Use and Occupancy. Guarantees or warranties that start at the date of shipment from the factory, or from the completion date of an individual portion of the project, are not acceptable.

PART 2 - PRODUCTS

2.1 SEED

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

B. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

1. General Turf Areas:

a. Perennial Ryegrass: 40%
b. Chewings Fescue: 30%
c. Kentucky Bluegrass: 30%

C. Grass Seed Mix: Proprietary seed mix as follows:

1. Available Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. New England Wetland Plants, Inc., Amherst, MA.

2.2 TURFGRASS SOD

A. Turfgrass Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with TPI's "Specifications for Turfgrass Sod Materials" in its "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

B. Turfgrass Species: Sod of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

1. Species: 50% Kentucky bluegrass (Poa pratensis) and 50% Perennial ryegrass (Lolium perenne).
2. Available Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Gold Star Sod Farms, Inc., Canterbury, NH.
b. Kingston Turf Farms, Inc. Kingston, RI.
c. Tuckahoe Turf Farms, Inc., Slocum, RI.

2.3 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.

1. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.
2. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

    a. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2.4 INORGANIC SOIL AMENDMENTS

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

B. Sand: Clean, washed, natural or manufactured, free of toxic materials, gradation suitable for use.

2.5 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

2.6 PLANTING ACCESSORIES

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

2.7 FERTILIZER

A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.8 EROSION-CONTROL MATERIALS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

B. Erosion-Control Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, a minimum of 0.92 lb/sq. yd., with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.

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

3.3 TURF AREA PREPARATION

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

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 8 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off DMH's property.

1. Apply fertilizer directly to subgrade before loosening.
2. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
3. Spread planting soil to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

    a. Reduce elevation of planting soil to allow for soil thickness of sod.

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

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least of 8 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 6 inches of soil. Till soil to a homogeneous mixture of fine texture.

    a. Apply fertilizer directly to surface soil before loosening.

3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and other extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf, off DMH's property.

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

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

F. Before planting, obtain Designer's acceptance of finish grading; restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.4 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged.

B. Sow seed at the rate of 3 to 4 lb/1000 sq. ft.

C. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes exceeding 1:6 with erosion-control fiber mesh and 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

3.5 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with nonasphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply mulch at a minimum rate of 1500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.6 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.7 TURF MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
2. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Provide and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
2. Water turf at a minimum rate of 1 inch per week.

C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain height appropriate for species without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.

D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

E. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with User Agency’s operations and others in proximity to the Work. Notify the DMH Project Manager and User Agency before each application is performed.

3.8 SATISFACTORY TURF

A. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches .

B. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

C. Reestablish turf that do not comply with requirements and continue maintenance until turf are satisfactory.

3.9 CLEANUP AND PROTECTION

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

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

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

END OF SECTION

CORRIGAN MHC GENERATOR REPLACEMENT

PROJECT NUMBER 2024-067A

THE COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF MENTAL HEALTH

1/15/2025
ISSUED FOR BID

DRAWING LIST

Number	Name
G000	COVERSHEET
A000	COVERSHEET
A101	FIRST FLOOR PLAN
A102	SECOND FLOOR PLAN
M000	HVAC COVERSHEET
M101	HVAC - FIRST FLOOR DEMOLITION PLAN
M201	HVAC - FIRST FLOOR PLAN
M400	HVAC DETAILS
E000	ELECTRICAL COVERSHEET
ED101	LIGHTING - FIRST FLOOR DEMOLITION PLAN
ED111	POWER - FIRST FLOOR DEMOLITION PLAN
ED112	POWER - SECOND & THIRD FLOOR DEMOLITION PLAN
E201	LIGHTING - FIRST FLOOR PLAN
E202	LIGHTING - SECOND FLOOR PLAN
E211	POWER - FIRST FLOOR PLAN
E212	POWER - SECOND & THIRD FLOOR PLAN
E221	SYSTEMS - FIRST FLOOR PLAN
E222	SYSTEMS - SECOND FLOOR PLAN
E300	ELECTRICAL ENLARGED PLANS
E400	ELECTRICAL DETAILS
E500	ELECTRICAL DIAGRAMS
E501	ELECTRICAL PHASING PLAN
E700	ELECTRICAL PANEL SCHEDULES

IMEG Engineers
10 Franklin Street
Boston MA. 02110
617.542.0810
www.imeg.com

CORRIGAN MHC GENERATOR
2024-067A 1-15-2025
ISSUED FOR BID

Mass DMH Department of Mental Health

COVER SHEET

G000

ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	AUTOMATIC DOOR OPERATOR WITH SENSOR
ATM	AUTOMATIC TELLER MACHINE
COPY	COPIER
DB	DOOR BELL
DISP	GARBAGE DISPOSAL
DLVL	DOCK LEVELER
DOOR	DOOR OPERATOR, ELECTRIC
DRY	DRYER, CLOTHS
DW	DISHWASHER
ELEV	ELEVATOR
ELVC	ELEVATOR CAB CONNECTION
ELVD	ELEVATOR AUDIO VISUAL DATA SYSTEM
EPT	ELECTRONIC PAPER TOWEL DISPENSER (NON-BATTERY)
ESP	ESPRESSO MACHINE
EWC	ELECTRIC WATER COOLER
EWCC	ELECTRIC WATER COOLER CONDENSER
FAN	CEILING FAN
FDO	FIRE DOOR OPERATOR
FFE	OWNER FURNISHED FIXTURES, FURNITURE, AND EQUIPMENT
FURN	OWNER FURNITURE
GWB	GYPSUM WALL BOARD
HD	HAND DRYER
ICE	ICE MACHINE
MS	MOTORIZED SHADE
MW	MICROWAVE
OHD	OVERHEAD DOOR
OVEN	OVEN, WALL
OC	ON CENTER
PFR	PLUMB FIXTURE RECEPT FOR LV VALVE POWER
PP	PUSH PAD AUTOMATIC DOOR OPERATOR (REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATION)
PW	POWER WASHER SPECIAL RECEPTACLE
RANGE	ELECTRICAL COOKTOP RANGE
REF	REFRIGERATOR
SIGN	DEDICATED SIGNAGE CIRCUIT
SINK	SCRUB SINK
STOVE	RANGE / OVEN APPLIANCE
TCP	TEMPERATURE CONTROLS PANEL
TRSH	TRASH COMPACTOR
TV	TELEVISION - MONITOR - DISPLAY
UCF	UNDERCOUNTER FREEZER
UCM	UNDERCOUNTER MICROWAVE
UCR	UNDERCOUNTER REFRIGERATOR
VEND	VENDING MACHINE

FIRE / SMOKE BARRIER DESIGNATIONS

THE LINE TYPES SHOWN ARE FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY RATINGS WITH THE LATEST SET OF ARCHITECTURAL PLANS AND FURNISH ALL MATERIALS REQUIRED TO COMPLY WITH THOSE RATINGS WHETHER SHOWN OR NOT.

ALL [FLOOR, FLOOR CEILING, AND ROOF CEILING] ASSEMBLIES SHALL BE DESIGNATED AS [1], [2], [3], [4] HOUR FIRE [/SMOKE], BARRIER(S), UNLESS NOTED OTHERWISE ON THE PLANS. RATINGS WERE ACQUIRED FROM THE ARCHITECTURAL PLANS DATED [**/**/**].

FIRE PARTITION	- -
1 HOUR FIRE BARRIER	— — — — — — — — — — — — — — — — — — — —
2 HOUR FIRE BARRIER OR WALL	— — — — — — — — — — — — — — — — — — — —
3 HOUR FIRE BARRIER OR WALL	— — — — — — — — — — — — — — — — — — — —
4 HOUR FIRE BARRIER OR WALL	— — — — — — — — — — — — — — — — — — — —
SMOKE PARTITION	. . . . .
SMOKE BARRIER	————————————
1 HOUR FIRE/SMOKE BARRIER OR SHAFT ENCLOSURE	— · — · — · — · — · — · — · —
2 HOUR FIRE/SMOKE BARRIER OR SHAFT ENCLOSURE	— ·· — ·· — ·· — ·· — ·· — ·· —
3 HOUR FIRE/SMOKE BARRIER	— · · · — · · · — · · · — · · · —
4 HOUR FIRE/SMOKE BARRIER	— · · · · — · · · · — · · · · —

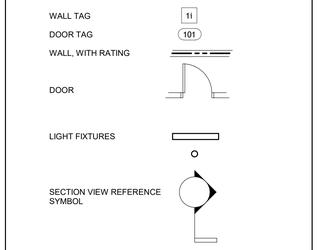
APPLICABLE CODES

CONTRACTOR SHALL COMPLY WITH APPLICABLE CODES AND LOCAL AMENDMENTS INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

BUILDING CODE:	IBC 20** EDITION UBC 20**
FIRE CODE:	IFC 20** EDITION -OR- NFPA: 1 20** EDITION
PLUMBING CODE:	IPC 20** EDITION UPC 20**
MECHANICAL CODE:	IMC 20** EDITION UMC 20**
ELECTRICAL CODE:	NFPA 70 (NEC) 2023 EDITION
LIFE SAFETY CODE:	NFPA 101 20** EDITION
ENERGY CONSERVATION CODE:	IECC 20** ASHRAE 90.1 20**
HEALTH DEPARTMENT CODE:	CURRENT EDITION
LOCAL BUILDING CODE:	CURRENT EDITION

SYMBOLS

BELOW IS A LEGEND OF SYMBOLS THAT PERTAIN TO THE DRAWING HEREIN:



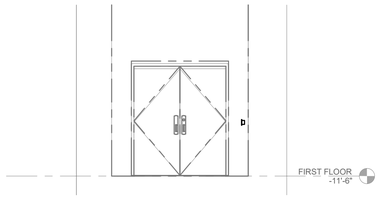
WALL SCHEDULE

Type Mark	Comments	Cross-Section	Description	Fire Rating	Width	Structural Material
A	2 LAYERS GWB	Vertical	STEEL STUD	2 HOUR	5"	Default Wall
A	2 LAYERS GWB	Vertical	STEEL STUD	2 HOUR	5"	Default Wall
A	2 LAYERS GWB	Vertical	STEEL STUD	2 HOUR	5"	Default Wall
A	2 LAYERS GWB	Vertical	STEEL STUD	2 HOUR	5"	Default Wall
A	2 LAYERS GWB	Vertical	STEEL STUD	2 HOUR	5"	Default Wall

DOOR SCHEDULE

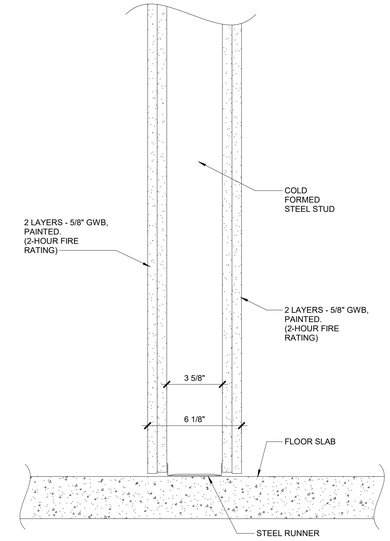
Type Mark	Count	Width	Head Height	Frame Type	Frame Material	Thickness	Fire Rating	Description	Comments
1	1	6'-0"	7'-0"	HM	14 GAUGE STEEL	1 3/4"	2 HOUR		UL10C
2	1	3'-0"	7'-0"	HM	14 GAUGE STEEL	1 3/4"	2 HOUR		UL10C
3	1	5'-0"	7'-0"	HM	14 GAUGE STEEL	1 3/4"	2 HOUR		UL10C

DOOR NOTES: PROVIDE NEW HARDWARE FOR ALL NEW DOORS, DOOR HARDWARE SHALL BE COORDINATED WITH BUILDING FACILITIES TO MATCH BUILDING STANDARD HARDWARE TYPE AND KEYING.



2 FIRST FLOOR NEW ELECTRIC CLOSET ELEVATION

NO SCALE



1 WALL SECTION

NO SCALE

ARCHITECTURAL DRAWING LIST

Number	Name
A000	COVERSHEET
A101	FIRST FLOOR PLAN
A102	SECOND FLOOR PLAN

3

Mass DMH Department of Mental Health

Project Name:
CORRIGAN MHC GENERATOR
Project No.: 2024-067A
IMEG Project No.: 24001755.00

Project Location
49 Hillside St
Fall River MA. 02720

Project Engineer
IMEG
The FUTURE. Built Smarter www.imegcorp.com
10 FRANKLIN STREET
BOSTON, MA 02110
P: 617.542.0810

Project Consultant

Site Number:
CAMIS Number:
Building Number:
Secretariat:

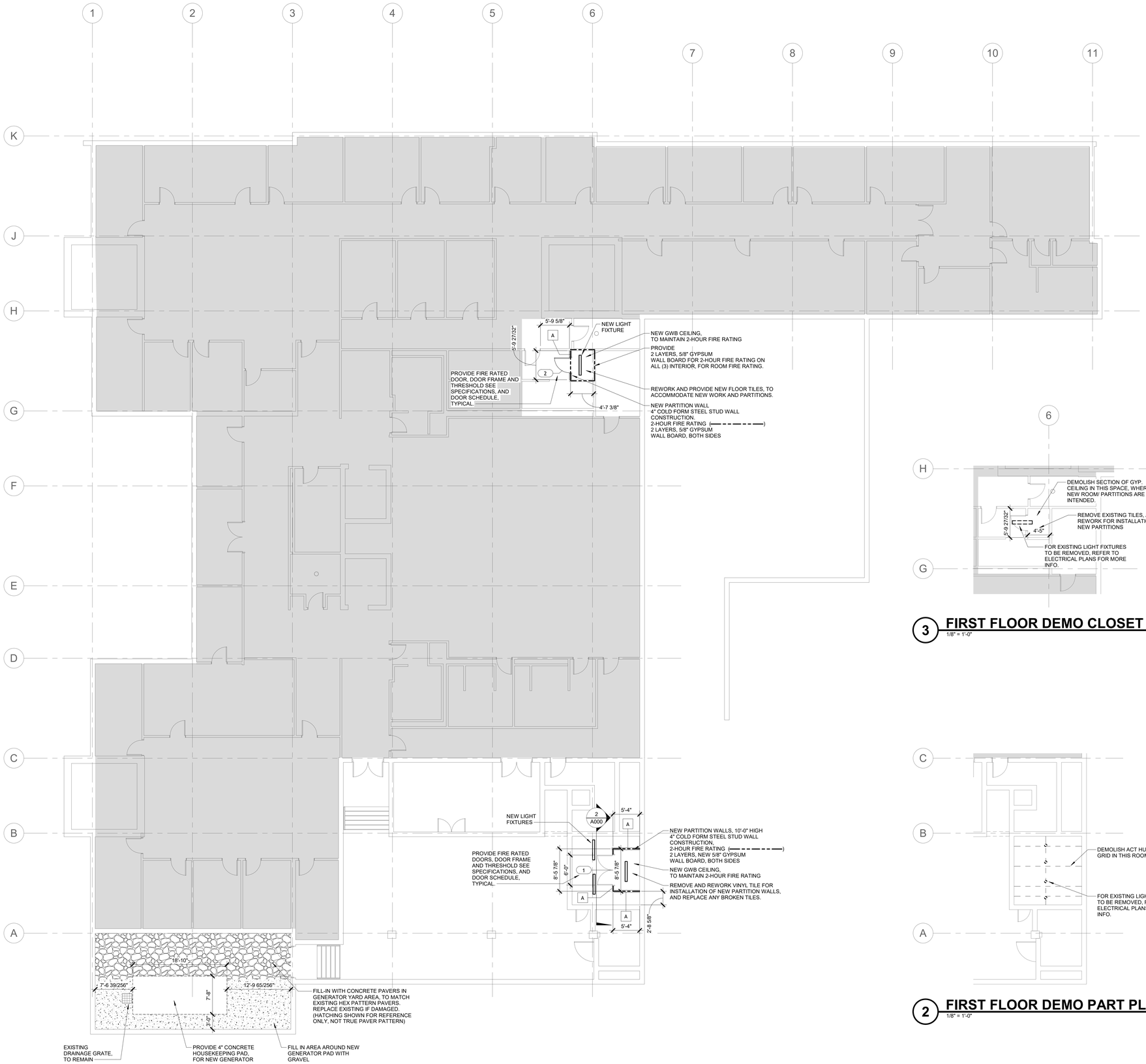
Original Issue Date
1/15/2025

Revisions
No. Description Date

Plan Name:
COVERSHEET

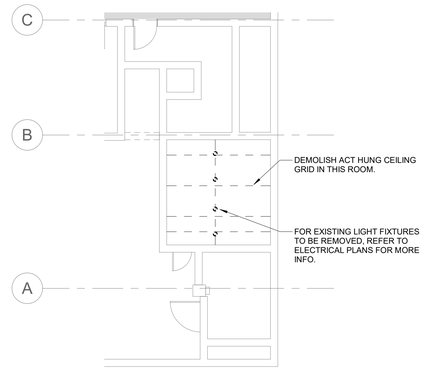
Drawing Number:
A000
Drawing of

File Path: XXXXXXXXXXX



1 FIRST FLOOR PLAN
1/8" = 1'-0"

3 FIRST FLOOR DEMO CLOSET PART PLAN
1/8" = 1'-0"



2 FIRST FLOOR DEMO PART PLAN
1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"
8 6 4 2 0 8 16
N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

Project Name:
CORRIGAN MHC GENERATOR
Project No.: 2024-067A
IMEG Project No.: 24001755.00

Project Location
49 Hillside St
Fall River MA.
02720

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Project Consultant

Site Number:
CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

Revisions
No. Description Date

Plan Name:
FIRST FLOOR PLAN

Drawing Number:
A101
Drawing of

1 SECOND FLOOR PLAN
1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"
8 6 4 2 0 8 16
N

File Path: XXXXXXXXXXX

Mass DMH Department of Mental Health

Project Name:
CORRIGAN MHC GENERATOR
Project No.: 2024-067A
IMEG Project No.: 24001755.00

Project Location
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Fall River MA.
02720

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Project Consultant

Site Number:
CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

Revisions
No. Description Date

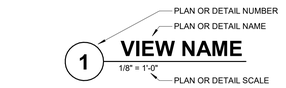
Plan Name:
SECOND FLOOR PLAN

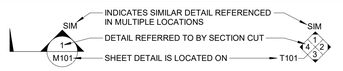
Drawing Number:
A102
Drawing of

VIEW KEY

NAME 10'-0" — LEVEL NAME, HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
———— NEW
– – – – – – – – EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
— — — — NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

MECHANICAL GENERAL NOTES:

THESE NOTES APPLY TO ALL MECHANICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED VENTILATION, PIPING AND TEMPERATURE CONTROL.

1. DRAWINGS SHOWING LOCATIONS OF EQUIPMENT, DUCTWORK, PIPING, ETC. ARE DIAGRAMMATIC AND MAY NOT ALWAYS REFLECT EXACT INSTALLATION CONDITIONS. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF DUCTWORK, PIPING, EQUIPMENT, ETC., AND MAY NOT INCLUDE ALL OFFSETS AND FITTINGS REQUIRED FOR COMPLETE INSTALLATION. THE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND THE WORK OF OTHERS WILL PERMIT.
2. DO NOT SCALE DRAWINGS. VERIFY ALL DIMENSIONS AND CLEARANCES FROM ARCHITECTURAL, STRUCTURAL, SUBMITTALS, AND OTHER APPROPRIATE DRAWINGS OR PHYSICALLY AT SITE. REVIEW ALL DRAWINGS, INCLUDING THOSE OF OTHER TRADES.
3. COORDINATE ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION TO PROVIDE CLEARANCES REQUIRED FOR OPERATION, MAINTENANCE, CODE COMPLIANCE, AND TO VERIFY NON-INTERFERENCE WITH OTHER WORK. DO NOT FABRICATE PRIOR TO VERIFICATION OF NECESSARY CLEARANCES FOR ALL TRADES. BRING ANY INTERFERENCES OR CONFLICTS TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE PROCEEDING WITH FABRICATION OR EQUIPMENT ORDERS.
4. REVIEW SPACE REQUIREMENTS OF EQUIPMENT SPECIFIED OR SUBSTITUTED AND MAKE REASONABLE ACCOMMODATIONS IN LAYOUT AND POSITIONING TO PROVIDE PROPER ACCESS.
5. ANY CHANGES REQUIRED TO ELIMINATE CONFLICTS OR THAT RESULT FROM A FAILURE TO COORDINATE SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL COST OR EXPENSE TO OTHERS.
6. EACH CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ELECTRICAL CHANGES REQUIRED FOR EQUIPMENT PROPOSED THAT DIFFERS FROM THE BASIS OF DESIGN.
7. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
8. SEAL ALL FLOOR, WALL, AND ROOF PENETRATIONS AIRTIGHT WHERE CONDUITS, PIPING, AND DUCTS PENETRATE. PENETRATIONS THROUGH EXTERIOR WALLS AND ROOF SHALL BE SEALED AIRTIGHT WITH WATERPROOFING MATERIALS RECOMMENDED BY MANUFACTURER FOR OUTDOOR USE.
9. CAULK ALL PIPE AND DUCT PENETRATIONS OF FULL HEIGHT NON-FIRE RATED WALL, PARTITION, FLOOR, AND ROOF ASSEMBLIES. THIS IS ESSENTIAL TO PREVENT NOISE TRANSMISSION FROM ONE ROOM TO ANOTHER AND TO PROVIDE THE DESIRED NC LEVELS WITHIN ROOMS.
10. WHERE PIPES AND DUCTS ARE SHOWN TO PENETRATE FLOORS, PROVIDE SLEEVED OPENINGS WITH THE TOP EDGE RAISED ABOVE FLOOR SURFACE IN ACCORDANCE WITH ALL RELEVANT SPEC SECTIONS. SEAL SLEEVE PERIMETER TO BE WATERTIGHT.
11. EQUIPMENT SIZES AND SERVICE CLEARANCE REQUIREMENTS VARY AMONG DIFFERENT MANUFACTURERS. CONSULT APPROVED SHOP DRAWINGS FOR EQUIPMENT SIZES AND REQUIRED SERVICE CLEARANCES. COORDINATE WITH LAYOUT OF EQUIPMENT PADS, PIPING, DUCTWORK, ETC.
12. DO NOT BLOCK TUBE PULL OR EQUIPMENT SERVICE CLEARANCES.
13. DO NOT EXCEED 25 LBS PER HANGER AND A MINIMUM SPACING OF 2'-0" ON CENTER WHEN ATTACHING TO METAL ROOF DECKING (LIMITATION NOT REQUIRED WITH CONCRETE ON METAL DECK). THIS 25 LBS. LOAD AND 2'-0" SPACING INCLUDE ADJACENT ELECTRICAL AND ARCHITECTURAL ITEMS HANGING FROM DECK. IF THE HANGER RESTRICTIONS CANNOT BE ACHIEVED, SUPPLEMENTAL FRAMING OFF STEEL FRAMING SHALL BE ADDED. ANCHORS EMBEDDED IN CONCRETE SHALL BE CRACKED CONCRETE APPROVED IN ACCORDANCE WITH SPECIFICATIONS.

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
A.C.	ASBESTOS ABATEMENT CONTRACTOR
C.C.	CIVIL CONTRACTOR
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
S.C.	SECURITY CONTRACTOR
T.C.	TECHNOLOGY CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR
V.C.	VENTILATION CONTRACTOR

HVAC ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
BMS / FMCS	BUILDING MANAGEMENT SYSTEM / FACILITY MANAGEMENT CONTROL SYSTEM
C	COMMON
CFSD	CONTROL/FIRE/SMOKE DAMPER
DN	DOWN
EA	EXHAUST/RELIEF AIR
FD	FIRE DAMPER
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FSD	FIRE/SMOKE DAMPER
MA	MIXED AIR
MV	MIXING VALVE
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
OA	OUTSIDE AIR
RA	RETURN AIR
SA	SUPPLY AIR
SCCR	SHORT CIRCUIT CURRENT RATING
SD	SMOKE DAMPER
TYP	TYPICAL

HVAC SYMBOL LIST

NOT ALL SYMBOLS MAY APPLY.

SYMBOL:	DESCRIPTION:
	DIRECTION OF AIR FLOW
	FLEXIBLE DUCT
	MANUAL VOLUME DAMPER
R	RISE IN DIRECTION OF AIR FLOW
D	DROP IN DIRECTION OF AIR FLOW
	DUCT CAP
	DUCT DOWN
	DUCT UP
	SUPPLY/OUTSIDE AIR DUCT SECTION
	RETURN AIR DUCT SECTION
	EXHAUST/RELIEF AIR DUCT SECTION
DPP	DRAIN - PIPING
	SHUTOFF VALVE NORMALLY CLOSED

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

Mass DMH Department of Mental Health

Project Name:
CORRIGAN MHC GENERATOR
Project No.: 2024-067A
IMEG Project No.: 24001755.00

Project Location
49 Hillside St
Fall River MA. 02720

Project Engineer
IMEG
The FUTURE. Built Smarter www.imegcorp.com
10 FRANKLIN STREET
BOSTON, MA 02110
P: 617.542.0810

Project Consultant

Site Number:
CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

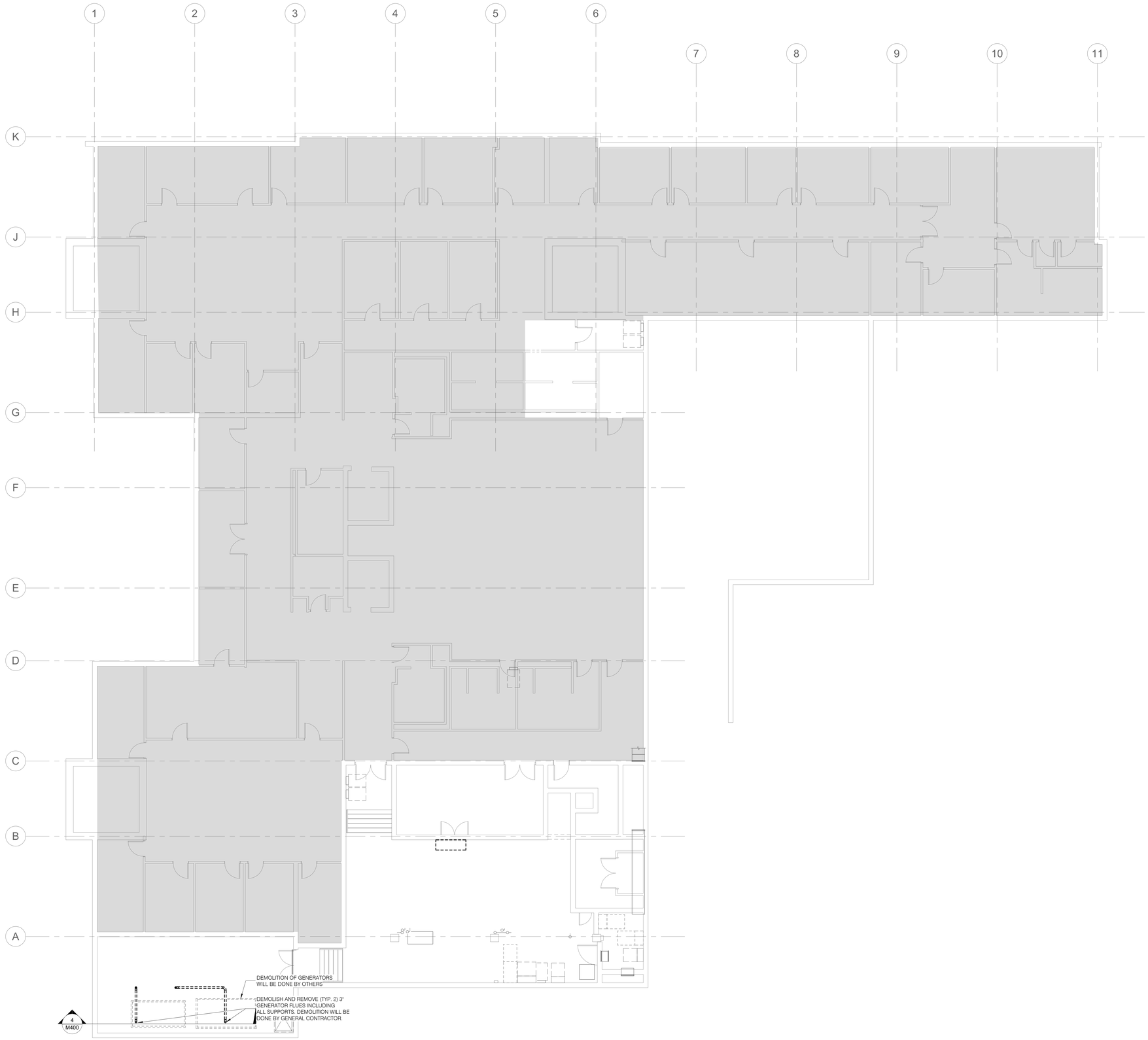
Revisions
No. Description Date

Plan Name:
HVAC COVERSHEET

Drawing Number:
M000
Drawing of

File Path: XXXXXXXXXXXX

GENERAL NOTE: ALL HVAC DEMOLITION WILL BE DONE BY GENERAL CONTRACTOR.



1 HVAC - FIRST FLOOR DEMOLITION PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

Project Name:
CORRIGAN MHC GENERATOR
Project No.: 2024-067A
IMEG Project No.: 24001755.00

Project Location
49 Hillside St
Fall River MA.
02720

Project Engineer
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Project Consultant

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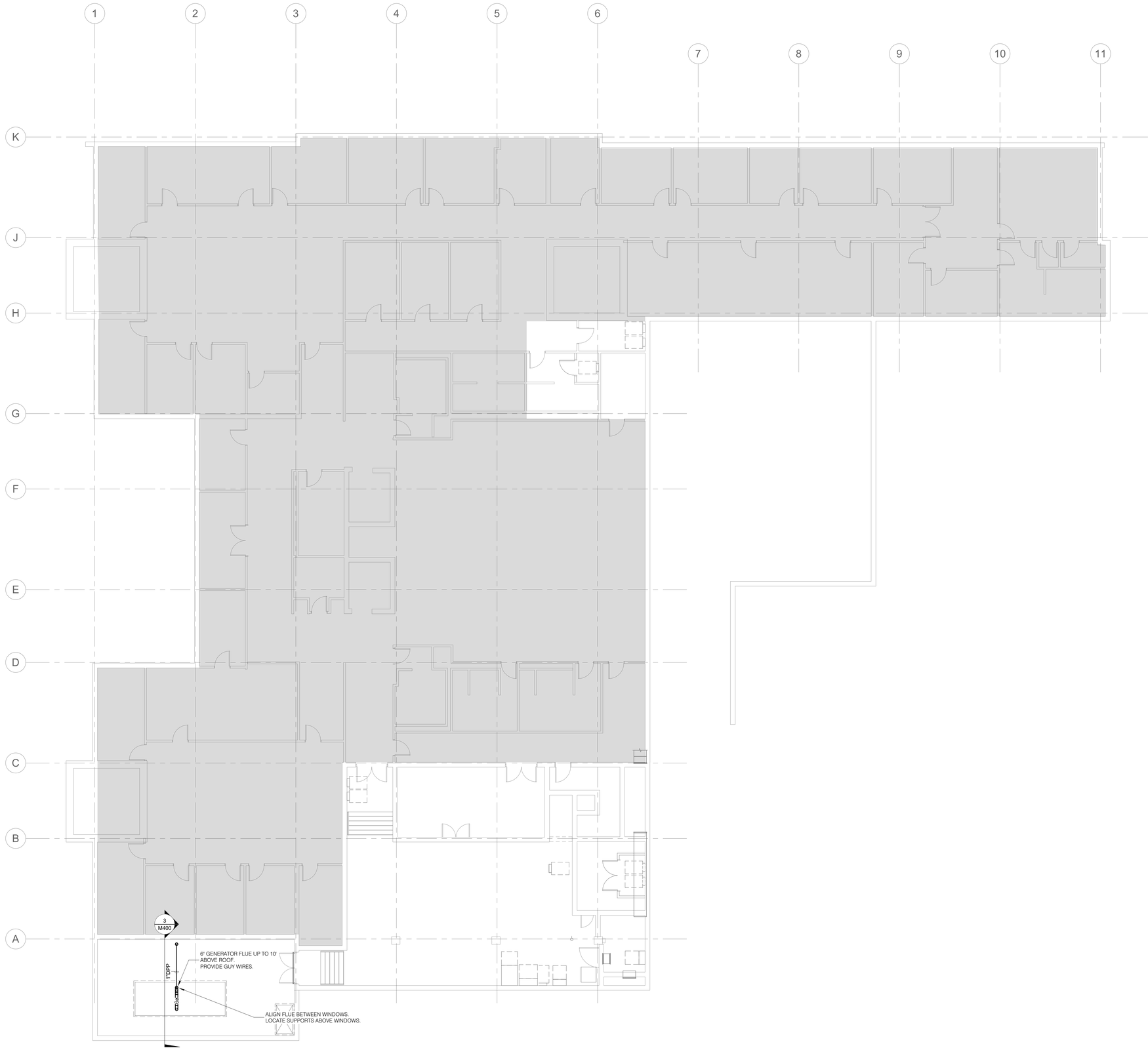
CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

Revisions
No. Description Date

Plan Name:
HVAC - FIRST FLOOR DEMOLITION PLAN

Drawing Number:
M101
Drawing of



1 HVAC - FIRST FLOOR PLAN
1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"
8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXX

Mass DMH Department of Mental Health

Project Name:
CORRIGAN MHC GENERATOR
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Fall River MA.
02720

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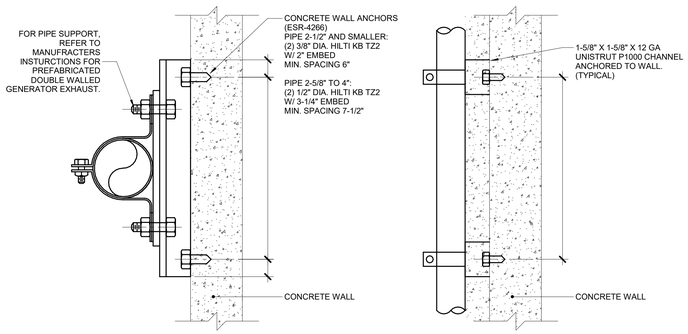
CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

Revisions
No. Description Date

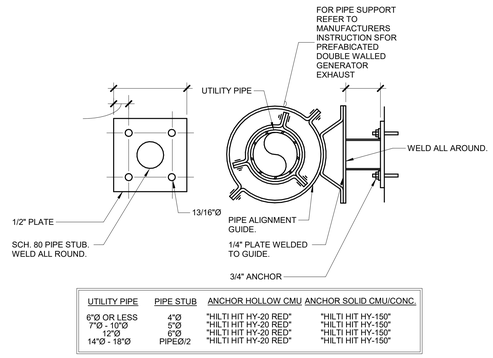
Plan Name:
HVAC - FIRST FLOOR PLAN

Drawing Number:
M201
Drawing of



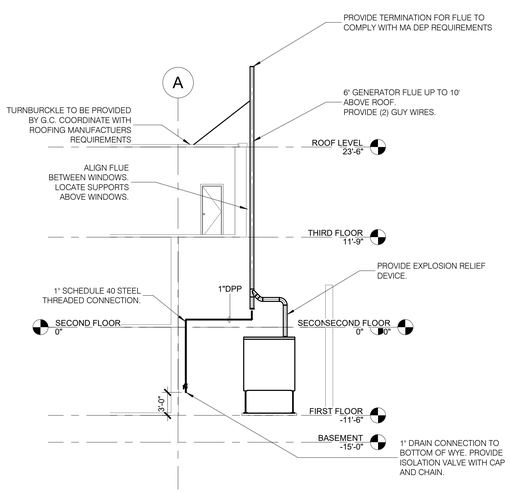
HORIZONTAL PIPE AGAINST WALL **VERTICAL PIPE AGAINST WALL**

1 PIPE SUPPORT ON CONCRETE WALL
12" = 1'-0"

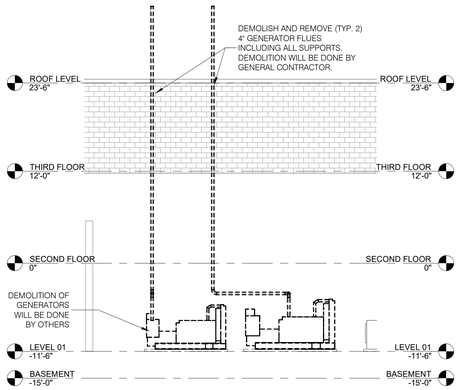


UTILITY PIPE	PIPE STUB	ANCHOR HOLLOW CMU	ANCHOR SOLID CMU/CONC.
6"Ø OR LESS	4"Ø	"HILTI HIT HY-20 RED"	"HILTI HIT HY-150"
7"Ø - 10"Ø	5"Ø	"HILTI HIT HY-20 RED"	"HILTI HIT HY-150"
12"Ø	6"Ø	"HILTI HIT HY-20 RED"	"HILTI HIT HY-150"
14"Ø - 18"Ø	PIPEØ/2	"HILTI HIT HY-20 RED"	"HILTI HIT HY-150"

2 PIPE - EXPANSION ALIGNMENT GUIDE
12" = 1'-0"



3 MECHANICAL NEW WORK
1/8" = 1'-0"



4 MECHANICAL DEMO WORK
1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"
8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXX

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Revisions
No. Description Date

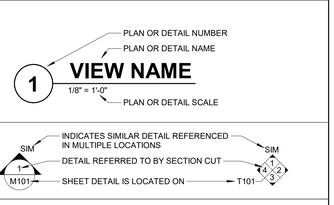
Plan Name:
HVAC DETAILS

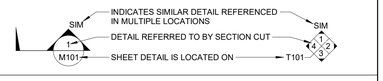
Drawing Number:
M400
Drawing of

VIEW KEY

NAME — LEVEL NAME
10'-0" — HEIGHT ABOVE PROJECT 0'-0"

1 — KEYNOTE: INDICATES NOTE USED TO DESCRIBE ADDITIONAL INFORMATION ABOUT WORK REQUIRED, SPECIFIC TO THE SHEET AND/OR DETAIL





LINE TYPE AND TAG KEY:

NEW WORK BY THIS CONTRACTOR (WIDE LINE)
——— NEW
- - - - - - - - EXISTING TO BE REMOVED (SHORT DASHED PATTERN)
— — — NEW UNDERFLOOR OR UNDERGROUND (LONG DASHED PATTERN)

HALFTONING DOES NOT MODIFY SCOPE.

'TAG'-E — TAGS WITH DASH 'E' INDICATES THE REFERENCED OBJECT IS EXISTING

TAG-1 — UNDERLINED TAG INDICATES OBJECT IS IN-SCOPE. IF NEW, ADDITIONAL INFORMATION IS AVAILABLE IN A SCHEDULE, MATERIAL LIST, OR SYMBOL LIST

INDICATES AN EXISTING SYSTEM'S POINT OF CONNECTION/REMOVAL

CONTRACTOR ABBREVIATION KEY

ABBR:	DESCRIPTION:
A.C.	ASBESTOS ABATEMENT CONTRACTOR
C.C.	CIVIL CONTRACTOR
C.M.	CONSTRUCTION MANAGER
E.C.	ELECTRICAL CONTRACTOR
G.C.	GENERAL CONTRACTOR
H.C.	HEATING CONTRACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
S.C.	SECURITY CONTRACTOR
T.C.	TECHNOLOGY CONTRACTOR
T.C.C.	TEMPERATURE CONTROLS CONTRACTOR
V.C.	VENTILATION CONTRACTOR

LED LUMINAIRE SCHEDULE

(DESC) DOOR:
FA - FLAT ALUMINUM
FS - FLAT STEEL
RA - REGRESSED ALUMINUM
RS - REGRESSED STEEL
FINISH:
PAF - PAINT AFTER FABRICATION
CFSA - COLOR-FINISH SELECTION BY ARCHITECT

DISTRIBUTION:
II - ANSI/IES TYPE 2 DISTRIBUTION
III - ANSI/IES TYPE 3 DISTRIBUTION
IV - ANSI/IES TYPE 4 DISTRIBUTION
V - ANSI/IES TYPE 5 DISTRIBUTION

BEAMWIDTH:
NSP - VERY NARROW SPOT
SP - SPOT
MD - MEDIUM
WD - WIDE
VWD - VERY WIDE
WW - WALL WASH

(L/L) LENS/LOUVER:
A - 125" ACRYLIC
B - BAFFLE/LOUVER
C - CLEAR ALZAK
F - FROSTED ACRYLIC
G - TEMPERED GLASS
K - KSH12 .125" ACRYLIC
K19 - KSH19 .156" ACRYLIC
M - MATTE DIFFUSE CLEAR
N - NONE
P - POLYCARBONATE
R - HIGH IMPACT DR ACRYLIC
S - SEMI-SPECULAR CLEAR
O - OTHER (SEE DESCRIPTION) [DESIGN SPECIFIC BLANKS]

(MTG) MOUNTING:
CL - CEILING SURFACE
CV - COVE
FR - FLANGED RECESSED
P - PERIMETER
PL - POLE
RE - RECESSED
SP - SUSPENDED
SU - SURFACE
UC - UNDER CABINET
WL - WALL
O - OTHER (SEE DESCRIPTION)

(WATT) PER: FIX - FIXTURE, FT - FOOT, LAMP

(TYPE) LED
LED - LIGHT EMITTING DIODE
TLED - TUBULAR LED LAMP
OLED - ORGANIC LED
DLED - DYNAMIC TUNABLE LED
RGB - COLOR CHANGING LED
RGBW - COLOR CHANGING + WHITE
RGBA - COLOR CHANGING + AMBER
RLED - RETROFIT LED
WLED - WARM DIM LED

(TYPE) DRIVER:
0-10V - 0-10V DIMMING
DALI - DIGITAL ADDRESSABLE
DMX - DIGITAL MULTIPLEX
EB - ELECTRONIC
ELV - ELECTRONIC LOW VOLTAGE
EM - EMERGENCY BATTERY
HL - HIGH/LOW (100%/50%) STEP DIM
LINE - LINE VOLTAGE DIMMING
ML - MULTI-LEVEL SWITCHING
MV - MULTI-VOLTAGE ELECTRONIC
REM - REMOTE
O - OTHER (SEE DESCRIPTION)

CATALOG NUMBER SHALL NOT BE CONSIDERED COMPLETE AND MATERIAL SHALL NOT BE ORDERED BY MANUFACTURER AND CATALOG NUMBER ONLY. THE COMPLETE DESCRIPTION AND THE SPECIFICATION SHALL BE COORDINATED WITH THE CATALOG NUMBER TO DETERMINE THE EXACT MATERIAL AND ACCESSORIES TO BE ORDERED. THE FIRST MANUFACTURER LISTED IS THE BASIS OF DESIGN.

VERIFY AND COORDINATE ALL CEILING TYPES WITH LUMINAIRE MOUNTING AND TRIM REQUIREMENTS PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
CONFIRM ALL COLORS AND FINISHES OF ALL LUMINAIRE COMPONENTS WITH ARCHITECT AND INTERIOR DESIGNER PRIOR TO THE RELEASE OF THE LUMINAIRE ORDER.
UNLESS INDICATED ON LIGHTING PLANS OR BELOW, REFER TO ARCHITECTURAL AND INTERIOR DESIGN ELEVATIONS, SECTIONS AND DETAILS FOR ALL SUSPENDED AND WALL MOUNTED LUMINAIRE MOUNTING HEIGHTS.

REFER TO SPECIFICATION SECTIONS [LED LIGHTING 26 51 19] [AND EMERGENCY LIGHTING INVERTER 26 52 15] FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
INTERIOR CORRELATED COLOR TEMPERATURE [2700, 3000, 3500, 4000/4100]K, COLOR RENDERING INDEX (CRI) AT OR ABOVE [80, 85, 90], UNLESS NOTED OTHERWISE.
EXTERIOR CORRELATED COLOR TEMPERATURE [2700, 3000, 3500, 4000/4100]K, COLOR RENDERING INDEX (CRI) AT OR ABOVE [80, 85, 90], UNLESS NOTED OTHERWISE.
[PROVIDE CHICAGO PLENUM CCEA FOR ALL RECESSED LUMINAIRES LOCATED IN PLENUM CEILINGS.]

ITEM	DESCRIPTION	L/L	MTG	DIMENSIONS L	W	H	DIA.	WATT ANSI WATTS	PER	LED TYPE	QTY	DELIVERED LUMENS (MIN)	DRIVER VOLTS	TYPE	MANUFACTURER AND MODEL
F1	MULTI-PURPOSE LED UTILITY LUMINAIRE		CL	4'-0"	5 1/4"	2 3/4"		29 W	FIX	LED	1	LUMENS	120 V	0-10V	LAMARLED DL-IR-48-M-35
F2	MULTI-PURPOSE LED UTILITY LUMINAIRE		SP	4'-0"	5 1/4"	2 3/4"		29 W	FIX	LED	1	LUMENS	120 V	0-10V	LAMARLED DL-IR-48-M-35 PROVIDE (2) 6' CHAIN FOR PENDANT MOUNTING

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
GB	GB	26 05 26	GROUND BUS
E / E	ECONN	26 05 33	ELECTRICAL CONNECTION
J / J	JB	26 05 33	JUNCTION BOX
DEM	DEM	26 09 13	ENERGY METER
DPM	DPM	26 09 13/ 26 24 13	DIGITAL POWER METER
ITDM	ITDM	26 24 13	IMPULSE-TOTALIZING DEMAND
EEM	EEM	26 09 13	EXTERNAL ENERGY METER
PQM	PQM	26 09 13	POWER QUALITY METER
CPC	CPC	26 09 16	CONTROL POWER CABINET
	EPO	26 09 16 26 32 13	EMERGENCY STOP / POWER OFF (N.C. AND N.O CONTACT)
ES	ES	26 09 16	EMERGENCY STOP, N.C. CONTACT
LA	FA-LA	26 09 16	LAMP ANNUNCIATOR
PB	PB	26 09 16	MOMENTARY PUSHBUTTON OPERATOR
	PANEL '###'	26 24 16	PANELBOARD - RECESS MOUNT
	PANEL '###'	26 24 16	PANELBOARD - SURFACE MOUNT
	FCS-#	26 28 16	FUSED COMBINATION STARTER REFER TO DISC/STA STARTER
GAAP		26 32 13	GENERATOR ANNUNCIATOR PANEL

ELECTRICAL SYMBOL LIST

SYMBOL:	TAG:	SPEC SECTION:	DESCRIPTION:
O	REC-DUP-O	26 27 26	DUPLEX RECEPTACLE CONTROLLED BY OCCUPANCY
O	REC-QUAD-O	26 27 26	QUAD RECEPTACLE CONTROLLED BY OCCUPANCY
	REC-DUP	26 27 26	DUPLEX RECEPTACLE, 125V
	REC-DUP-GFI	26 27 26	DUPLEX GFI RECEPTACLE, 125V
G	REC-DUP-GFI-R	26 27 26	GROUND FAULT DEVICE
W	REC-DUP-WP	26 27 26	DUPLEX GFI WEATHERPROOF RECEPTACLE 125V
X	REC-DUP-XP	26 27 26	DUPLEX RECEPTACLE, EXPLOSION PROOF, 125V
	REC-ISO	26 27 26	ISOLATED GROUND RECEPTACLE, 125V
S	REC-ISO-SUR	26 27 26	ISOLATED GROUND RECEPTACLE WITH SURGE SUPPRESSION, 125V
S	REC-ISO-SUR-QUAD	26 27 26	ISOLATED GROUND QUAD RECEPTACLE WITH SURGE SUPPRESSION, 125V
U	REC-USB	26 27 26	DUPLEX RECEPTACLE, USB CHARGING
	REC-ARC	26 27 26	ARC FAULT CIRCUIT INTERRUPTER RECEPT 125V
AF	REC-AFGF	26 27 26	REC AFCI, GFCI, TAMPER RESISTANT
	REC-SIM-520R	26 27 26	SIMPLEX RECEPTACLE, 125V
	REC-SIM-530R	26 27 26	RECEPTACLE, 125V
	REC-SIM-550R	26 27 26	RECEPTACLE 125V, 50A, 125V
	REC-SIM-620R	26 27 26	RECEPTACLE, 6-20R, 250V
	REC-SIM-630R	26 27 26	RECEPTACLE, 6-30R, 250V
	REC-SIM-650R	26 27 26	RECEPTACLE, 6-50R, 250V
	REC-SIM-720R	26 27 26	RECEPTACLE, 7-20R, 277V
	REC-SIM-730R	26 27 26	RECEPTACLE, 7-30R, 277V
	REC-SIM-750R	26 27 26	RECEPTACLE, 7-50R, 277V
	REC-SIM-1420R	26 27 26	RECEPTACLE, 14-20R, 125/250V
	REC-SIM-1430R	26 27 26	RECEPTACLE, 14-30R, 125/250V
	REC-SIM-1450R	26 27 26	RECEPTACLE, 14-50R, 125/250V
	REC-SIM-1460R	26 27 26	RECEPTACLE, 14-60R, 125/250V
	REC-SIM-1520R	26 27 26	RECEPTACLE, 15-20R, 250V, 3PH
	REC-SIM-1530R	26 27 26	RECEPTACLE, 15-30R, 250V, 3PH
	REC-SIM-1550R	26 27 26	RECEPTACLE, 15-50R, 250V, 3PH
	REC-SIM-1560R	26 27 26	RECEPTACLE, 15-60R, 250V, 3PH
	REC-SIM-L520R	26 27 26	RECEPTACLE, LOCKING TYPE, L5-20R, 125V
	REC-SIM-L530R	26 27 26	RECEPTACLE, LOCKING TYPE, L5-30R, 125V
	REC-SIM-L620R	26 27 26	RECEPTACLE, LOCKING L6-20R, 250V
	REC-SIM-L630R	26 27 26	RECEPTACLE, LOCKING L6-30R, 250V
	REC-SIM-L720R	26 27 26	RECEPTACLE, LOCKING L7-20R, 277V
	REC-SIM-L730R	26 27 26	RECEPTACLE, LOCKING L7-30R, 277V
	REC-SIM-L1420R	26 27 26	RECEPTACLE, LOCKING L14-20R, 125/250V
	REC-SIM-L1430R	26 27 26	RECEPTACLE, LOCKING L14-30R, 125/250V
	REC-SIM-L1520R	26 27 26	RECEPTACLE, LOCKING L15-20R, 250V, 3PH
	REC-SIM-L1530R	26 27 26	RECEPTACLE, LOCKING L15-30R, 250V, 3PH
	REC-SIM-L1620R	26 27 26	RECEPTACLE, L16-20R, 480V, 3PH
	REC-SIM-L1630R	26 27 26	RECEPTACLE, L16-30R, 480V, 3PH
	REC-SIM-L2120R	26 27 26	RECEPTACLE, LOCKING L21-20R, 120/208V, 3PH
	REC-SIM-L2130R	26 27 26	RECEPTACLE, LOCKING L21-30R, 120/208V, 3PH
X	REC-SIM-XP	26 27 26	RECEPTACLE, EXPLOSION PROOF, 125V
	REC-TAMP	26 27 26	DUPLEX RECEPTACLE, TAMPER RESISTANT, 125V
	REC-TAMP-GFI	26 27 26	GFI DUPLEX RECEPTACLE, TAMPER RESISTANT, 125V
	REC-TAMP-QUAD	26 27 26	QUAD RECEPTACLE, TAMPER RESISTANT, 125V
	REC-QUAD	26 27 26	QUAD RECEPTACLE, 125V
	REC-QUAD-GFI	26 27 26	QUAD GFI RECEPTACLE, 125V
U	REC-QUAD-USB	26 27 26	QUAD RECEPTACLE, USB 125V
W	REC-QUAD-WP	26 27 26	QUAD GFI WEATHERPROOF RECEPTACLE, 125V
	REC-DUP-PED	26 27 26	RECEPTACLE - PEDESTAL STYLE
	REC-PED-QUAD	26 27 26	RECEPTACLE - PEDESTAL STYLE
#	REC-Z#	26 27 26	IEC PIN AND SLEEVE RECEPTACLE, 600V
	PP#	26 27 23	POWER POLE

ELECTRICAL RENOVATION NOTES:

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS.

1. EXISTING CONDITIONS ARE SHOWN BASED ON INFORMATION OBTAINED FROM FIELD SURVEYS, EXISTING BUILDING DOCUMENTS. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
2. NOT ALL EXISTING EQUIPMENT, LUMINAIRES, AND CONDUIT ARE SHOWN. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS AND REPORT CONFLICTS.
3. CONTRACTOR SHALL REVIEW EXISTING CONDITIONS PRIOR TO FABRICATION OF CABLE TRAY, BUSWAY, CONDUIT RACKS, AND OTHER SYSTEMS. RISES AND DROPS MAY BE NECESSARY BECAUSE OF EXISTING FIELD CONDITIONS.
4. ELECTRICAL CONTRACTOR SHALL REVIEW EXISTING CONDITIONS TO VERIFY ACCESSIBILITY TO THE AREAS OF THEIR WORK INCLUDING WALLS, FLOOR, CEILINGS, TILES/GRID, AND ROOF. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE CUTTING, REMOVAL, PATCHING, AND REINSTALLATION OF AFFECTED AREAS ASSOCIATED WITH THEIR WORK BY COORDINATING WITH THE GENERAL CONTRACTOR OR QUALIFIED CONTRACTOR. CONTRACTOR SHALL NOTIFY THE PRIME CONTRACTOR OF AFFECTED AREAS PRIOR TO BIDDING.
5. WHERE EXISTING ELECTRICAL SYSTEMS ARE LOCATED IN AREAS THAT CONFLICT WITH NEW EQUIPMENT, PIPING, OR DUCTWORK TO BE INSTALLED, EACH CONTRACTOR SHALL EITHER ARRANGE NEW EQUIPMENT, CONDUIT, OR DUCTWORK IN SUCH A FASHION THAT IT DOES NOT CONFLICT WITH EXISTING SYSTEMS, OR REWORK EXISTING ELECTRICAL SYSTEMS TO ALLOW FOR INSTALLATION OF NEW EQUIPMENT, PIPING, OR DUCTWORK.

ELECTRICAL PHASING NOTES:

THESE NOTES APPLY TO ALL ELECTRICAL SHEETS AND TRADES, INCLUDING BUT NOT LIMITED TO, LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS.

1. REFER TO ELECTRICAL PHASING PLAN FOR GENERAL DESCRIPTION OF PHASES.
2. REFER TO DIVISION 1 SPECIFICATIONS.
3. THE MECHANICAL, ELECTRICAL, AND TECHNOLOGY DRAWINGS DO NOT DEPICT THE MEANS AND METHODS TO MEET THE REQUIREMENTS OF THE PHASING CRITERIA.
4. REVIEW PROJECT PHASING PLANS TO COORDINATE DEMOLITION WORK, OUTAGES, ETC. WITH AFFECTED ADJACENT AREAS.
5. PROVIDE TEMPORARY LIGHTING, POWER, FIRE ALARM, AND OTHER LOW VOLTAGE SYSTEMS, ETC. AS NEEDED TO MAINTAIN SERVICE TO ALL AREAS DURING ALL PHASES OF PROJECT.

EQUIPMENT ABBREVIATION KEY

ABBR:	DESCRIPTION:
AD	AUTOMATIC DOOR OPERATOR WITH SENSOR
ATM	AUTOMATIC TELLER MACHINE
ATS	AUTOMATIC TRANSFER SWITCH
COF	COFFEE
COPY	COPIER
DB	DOOR BELL
DISP	GARBAGE DISPOSAL
DLVL	DOCK LEVELER
DOOR	DOOR OPERATOR, ELECTRIC
DRY	DRYER, CLOTHS
DW	DISHWASHER
ETR	EXISTING TO REMAIN
ER	REMOVE EXISTING
ELEV	ELEVATOR
ELVC	ELEVATOR CAB CONNECTION
ELVD	ELEVATOR AUDIO VISUAL DATA SYSTEM
EPT	ELECTRONIC PAPER TOWEL DISPENSER (NON-BATTERY)
ESP	ESPRESSO MACHINE
EWC	ELECTRIC WATER COOLER
EWCC	ELECTRIC WATER COOLER CONDENSER
FAN	CEILING FAN
FDO	FIRE DOOR OPERATOR
FFE	OWNER FURNISHED FIXTURES, FURNITURE, AND EQUIPMENT
FURN	OWNER FURNITURE
HD	HAND DRYER
HOOD	KITCHEN EXHAUST HOOD
ICE	ICE MACHINE
MS	MOTORIZED SHADE
MW	MICROWAVE
OHD	OVERHEAD DOOR
OVEN	OVEN, WALL
PFR	PLUMB FIXTURE RECEPT FOR LV VALVE POWER
PP	PUSH PAD AUTOMATIC DOOR OPERATOR (REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATION)
PW	POWER WASHER SPECIAL RECEPTACLE
RANGE	ELECTRICAL COOKTOP RANGE
REF	REFRIGERATOR
SIGN	DEDICATED SIGNAGE CIRCUIT
SINK	SCRUB SINK
STOVE	RANGE / OVEN APPLIANCE
TCP	TEMPERATURE CONTROLS PANEL
TRSH	TRASH COMPACTOR
TV	TELEVISION - MONITOR - DISPLAY
UCF	UNDERCOUNTER FREEZER
UCM	UNDERCOUNTER MICROWAVE
UCR	UNDERCOUNTER REFRIGERATOR
VEND	VENDING MACHINE

ELECTRICAL GENERAL NOTES:

1. SHADED LUMINAIRE OR DEVICE INDICATES LUMINAIRE OR DEVICE IS CONNECTED TO AN EMERGENCY CIRCUIT.
2. REFER TO SHEET **E-000** FOR LUMINAIRE SCHEDULE.

LUMINAIRE KEY:

LUMINAIRE — F1 = FIXTURE TAG
1 = CIRCUIT NUMBER
a = SWITCH DESIGNATION
"NL" INDICATES LUMINAIRE IS UNSWITCHED FOR NIGHT LIGHT.
"SE" INDICATES LUMINAIRE IS SWITCHED/CONTROLLED DURING NORMAL OPERATION AND OPERATES FROM **[EMERGENCY BATTERY (EXTEND UNSWITCHED CIRCUIT LEG TO BATTERY)] [EMERGENCY CIRCUIT]** UPON LOSS OF POWER.

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: F1 / 1 / a / NL

DEVICE KEY:

DEVICE — # = MOUNTING (IF APPLICABLE)
1 = CIRCUIT NUMBER

*IF LABEL IS ORIENTED HORIZONTALLY A SLASH WILL SEPARATE THIS INFORMATION. EX: A / 1

ELECTRICAL MOUNTING SUBSCRIPT KEY:

A	MOUNT AT +6" TO CENTERLINE ABOVE COUNTER OR BACKSPLASH
C	MOUNT AT CEILING (DEVICE OR ROUGH-IN CONTEXT)
H	MOUNT ORIENTED HORIZONTALLY
L	MOUNT IN CASEWORK
M	MOUNT IN MODULAR FURNITURE
O	WIRING DEVICE, OCCUPANCY CONTROLLED
R	MOUNT IN SURFACE RACEWAY
S	SURFACE MOUNTED
W	WEATHERPROOF WIRING DEVICE, NEMA 3R WHILE-IN-USE COVER, WR LISTED
WG	WIRE GUARD
WP	WEATHERPROOF

ELECTRICAL INSTALLATION NOTES:

1. CIRCUIT NUMBERS ARE SHOWN FOR CIRCUIT IDENTIFICATION. CIRCUITING SHALL AGREE WITH NUMBERING ON THE PANEL PROVIDED. COMMON NEUTRALS MAY NOT BE USED FOR BRANCH CIRCUITS. BALANCE THE LOAD ON PANEL AS EVENLY AS POSSIBLE BETWEEN EACH PHASE.
2. EMERGENCY, LEGALLY REQUIRED, OPTIONAL STANDBY] [LIFE SAFETY, CRITICAL, EQUIPMENT BRANCH WIRING FOR FEEDERS AND BRANCH CIRCUITS SHALL BE ROUTED IN SEPARATE RACEWAY, JUNCTION BOXES, PULL BOXES, AND CABINETS. WIRING FOR EACH BRANCH SHALL BE INDEPENDENT FROM OTHER BRANCHES, INCLUDING THE NORMAL BRANCH.
3. FLUSH MOUNT ALL LIGHTING CONTROL DEVICES AT +42" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED.
4. FLUSH MOUNT ALL DUPLEX RECEPTACLES AND TECHNOLOGY OUTLETS AT +18" FROM FLOOR (CENTERLINE DIMENSION), EXCEPT WHERE OTHERWISE NOTED. RECEPTACLES AND OUTLETS MAY BE SURFACE MOUNTED WHEN CONDUIT IS SPECIFIED EXPOSED MOUNT EXTERIOR LOCATED RECEPTACLES WITH WHILE-IN-USE COVERS AT +20" FROM FINISHED GRADE (CENTER DIMENSIONS) TO MAINTAIN INSTALLATION ADA COMPLIANCE.
5. ALL MATERIALS USED TO SEAL PENETRATIONS OF FIRE RATED WALLS AND FLOORS SHALL BE TESTED AND CERTIFIED AS A SYSTEM PER ASTM E814 STANDARDS FOR FIRE TESTS OF THROUGH-PENETRATION FIRESTOPS. REFER TO **[27 05 03 AND 28 05 03] [DIVISION 7] [26 05 03]** FOR ADDITIONAL INFORMATION AND REQUIREMENTS SPECIFIC TO FIRESTOPPING.
6. CONNECTION FOR ELECTRIC WATER COOLERS (EWC) SHALL BE A JUNCTION BOX CONCEALED BEHIND WATER COOLER ACCESS PLATE OR BE A GFI RECEPTACLE LOCATED DIRECTLY BELOW AND CENTERED ON EWC. CONTRACTOR SHALL VERIFY TYPE OF EWC TO BE INSTALLED.
7. MOUNT ALL FIRE ALARM PULL STATIONS AT +42" FROM FLOOR (CENTERLINE DIMENSION) EXCEPT WHERE OTHERWISE NOTED.
8. INSTALL ALL WALL MOUNTED FIRE ALARM NOTIFICATION DEVICES AT 90" ABOVE FINISHED FLOOR OR 6" BELOW THE CEILING, WHICHEVER IS LOWER, EXCEPT WHERE OTHERWISE NOTED. HEIGHT SHALL BE MEASURED TO THE TOP OF THE DEVICE.
9. CONTRACTOR SHALL COORDINATE THE LOCATION OF ALL CEILING MOUNTED DEVICES AND EQUIPMENT WITH LUMINAIRES, SPRINKLER, AND CEILING DIFFUSERS. CENTER ALL DEVICES IN CEILING TILE PATTERN. SMOKE DETECTORS,CARBON MONOXIDE DETECTORS, AND OCCUPANCY/VACANCY SENSORS SHALL BE LOCATED NO CLOSER THAN 3 FEET TO AN AIR SUPPLY DIFFUSER OR RETURN GRILLE. CARBON MONOXIDE DETECTORS SHALL BE LOCATED 10 PLUS FT FROM FIRE PLACES, COOKING, AND SIMILAR FUEL-BURNING APPLIANCES.
10. CONTRACTOR SHALL VERIFY ALL FURNITURE, MODULAR FURNITURE, AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS, AND REVIEWED SHOP DRAWINGS. PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION, THIS CONTRACTOR SHALL ADJUST RECEPTACLES, OUTLETS, OR CONNECTION LOCATIONS TO ACCOMMODATE FURNITURE AND/OR EQUIPMENT.
11. ELECTRICAL AND TECHNOLOGY EQUIPMENT SHALL BE MOUNTED TO AVOID IMPEDANCE OF, OPERATION OF, AND/OR ACCESS TO ELECTRICAL AND MECHANICAL EQUIPMENT. ALL MOUNTING OF ELECTRICAL AND TELECOMMUNICATIONS EQUIPMENT, ON EQUIPMENT SUPPLIED BY ANOTHER CONTRACTOR, SHALL BE APPROVED IN ADVANCE BY THE OTHER CONTRACTOR.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OPENINGS REQUIRED IN WALLS. ALL OPENINGS SHALL BE REPAIRED TO MATCH EXISTING BY A QUALIFIED CONTRACTOR AT THE EXPENSE OF THIS CONTRACTOR. ALL CONDUITS THROUGH WALLS SHALL BE GROUTED OR SEALED INTO OPENINGS.
13. EACH CONTRACTOR IS RESPONSIBLE FOR DAMAGE CAUSED BY THEIR ACTIONS TO THE WALLS, FLOORS, CEILINGS, AND ROOFS. THE CONTRACTOR WHOSE WORK CAUSES DAMAGE IS RESPONSIBLE FOR PATCHING TO MATCH ORIGINAL CONSTRUCTION, FIRE RATING, AND FINISH.
14. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN, ELECTRICAL, TECHNOLOGY AUDIO/VISUAL, AND OTHER ELECTRICAL PLANS FOR EXACT LOCATIONS OF ALL CEILING MOUNTED DEVICES, OTHER THAN SPRINKLERS.
15. ELECTRICAL IDENTIFICATION. REFER TO SPECIFICATION SECTION 26 05 53 FOR COLOR/LABEL REQUIREMENTS FOR CONDUIT, BOX, CABLE/WIRE, AND EQUIPMENT.

ELECTRICAL ABBREVIATION KEY

ABBR:	DESCRIPTION:
ABV	ABOVE
AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ASR	ARCHITECTURAL SURFACE RACEWAY
BC	BELOW COUNTER
C	CONDUIT (BRANCH CIRCUIT OR FEEDER CONTEXT)
CO	CONDUIT AND BOX ROUGH-IN ONLY (ROUGH-IN ONLY)
EG	EQUIPMENT GROUND
EGC	EQUIPMENT GROUNDING CONDUCTOR
EOL	END OF LINE
EPO	EMERGENCY POWER OFF
GFR	GROUND FAULT REMOTE
HOA	HAND/OFF/AUTO
ITR	IT RACK MOUNTED RECEPTACLE
NC	NORMALLY CLOSED
NEMA #	NEMA RATING
NIC	NOT IN CONTRACTED SCOPE
NO	NORMALLY OPEN
ROOF	EQUIPMENT LOCATED ON ROOF ABOVE
SM	SURFACE MOUNTED
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED

Mass DMH Department of Mental Health

Project Name:
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Project No.: 2024-067A
IMEG Project No.: 24001755.00

Project Location
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Fall River MA. 02720

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CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

Revisions
No. Description Date

Plan Name:
ELECTRICAL COVERSHEET

Drawing Number:
E000
Drawing of

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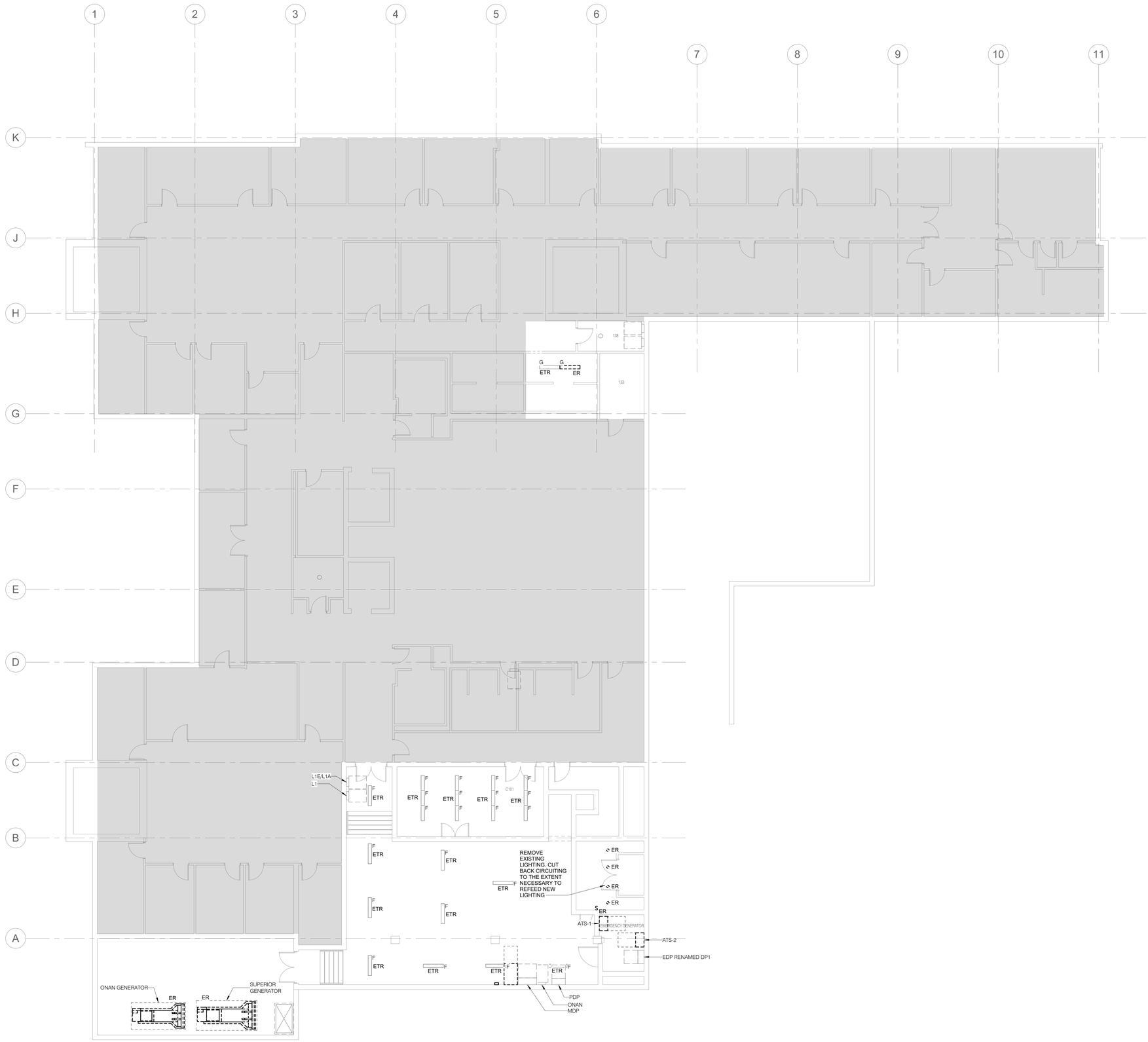

1 LIGHTING - FIRST FLOOR DEMOLITION PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

Project Name:
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Project No.: 2024-067A
IMEG Project No.: 24001755.00

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Plan Name:
LIGHTING - FIRST FLOOR DEMOLITION PLAN

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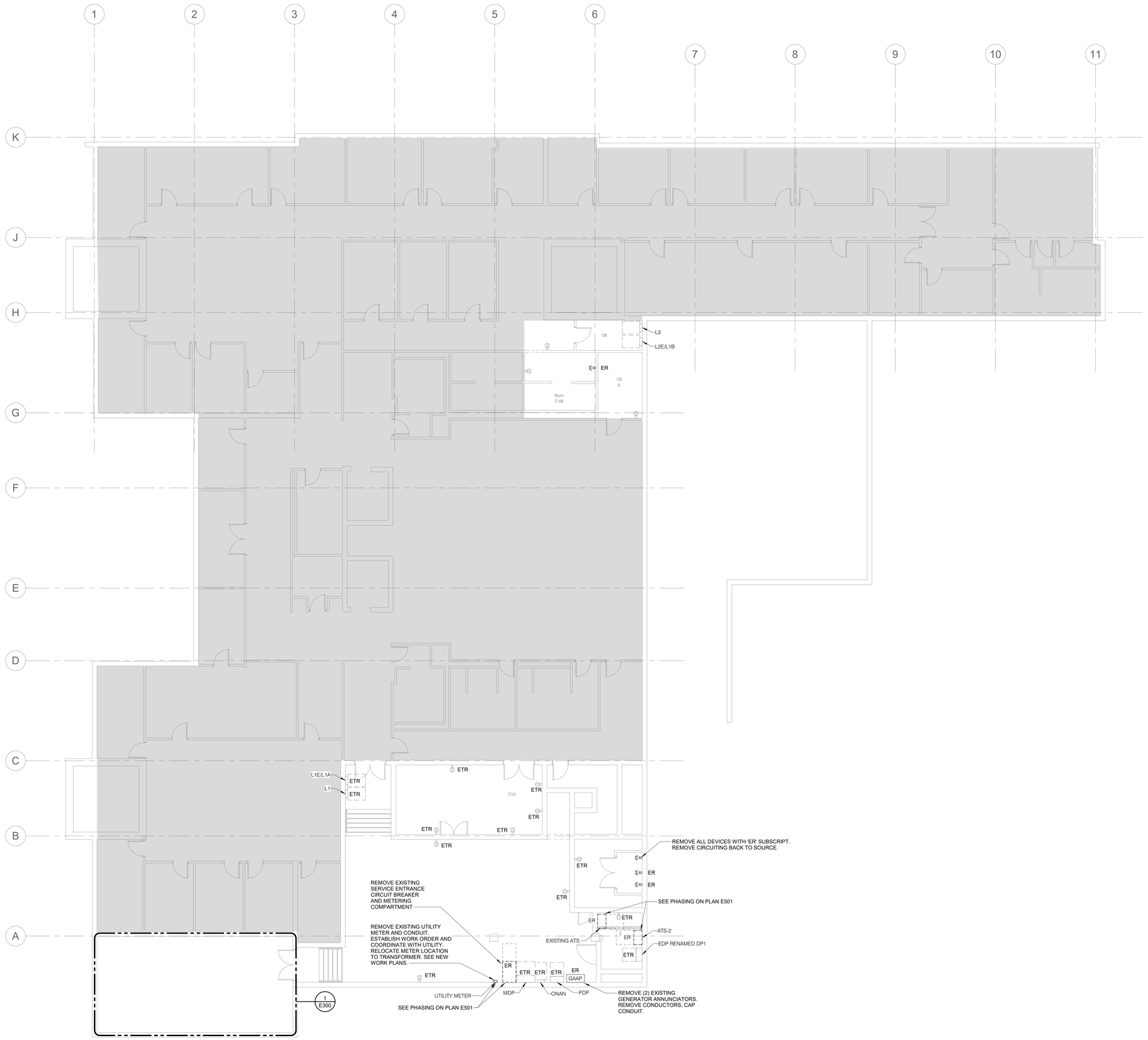

1 POWER - FIRST FLOOR DEMOLITION PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

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No.	Description	Date

Plan Name:
POWER - FIRST FLOOR DEMOLITION PLAN

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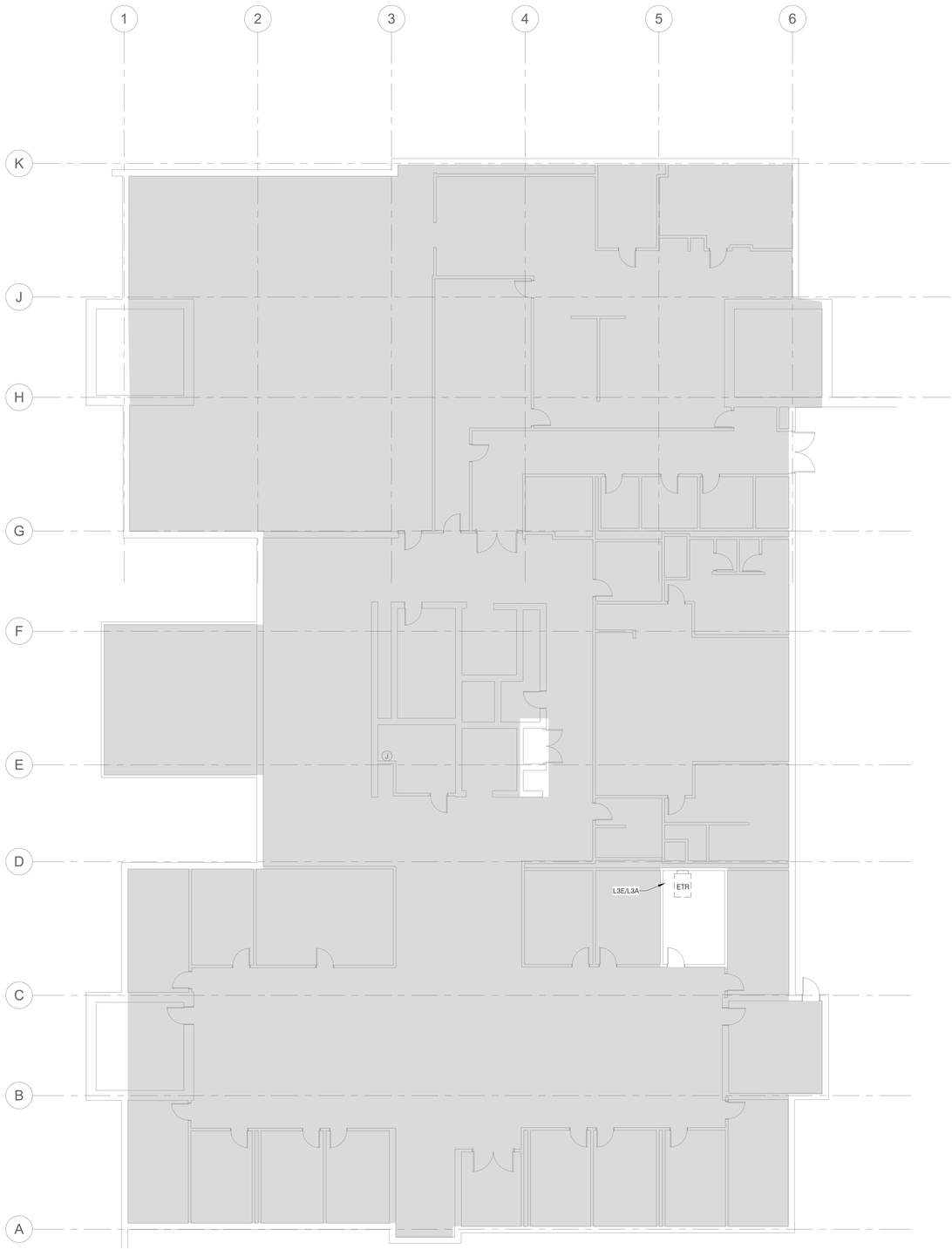
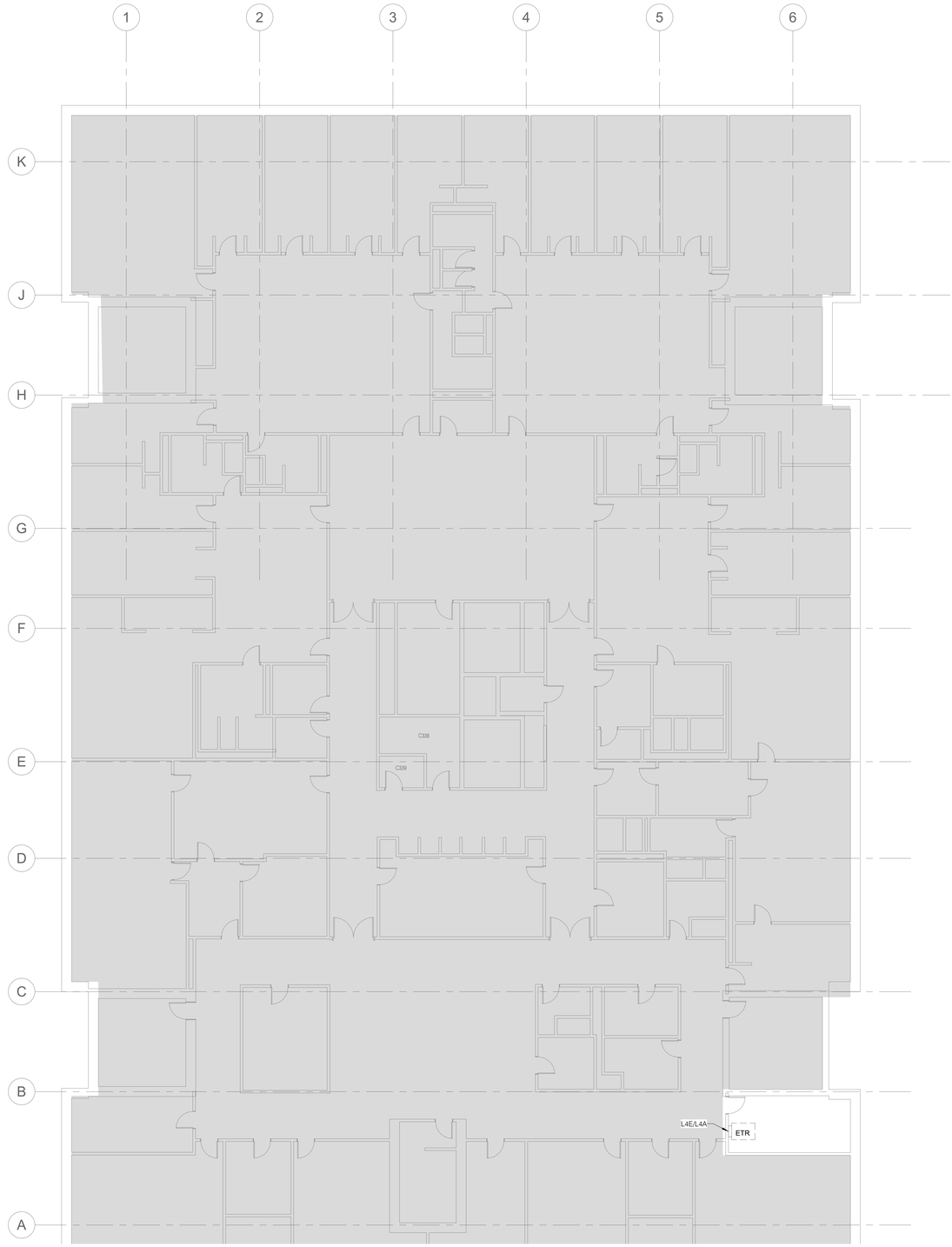


1 POWER - SECOND FLOOR DEMOLITION PLAN
1/8" = 1'-0"



2 POWER - THIRD FLOOR DEMOLITION PLAN
1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"
8 6 4 2 0 8 16
N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

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No. Description Date

Plan Name:
POWER - SECOND & THIRD FLOOR DEMOLITION PLAN

Drawing Number:
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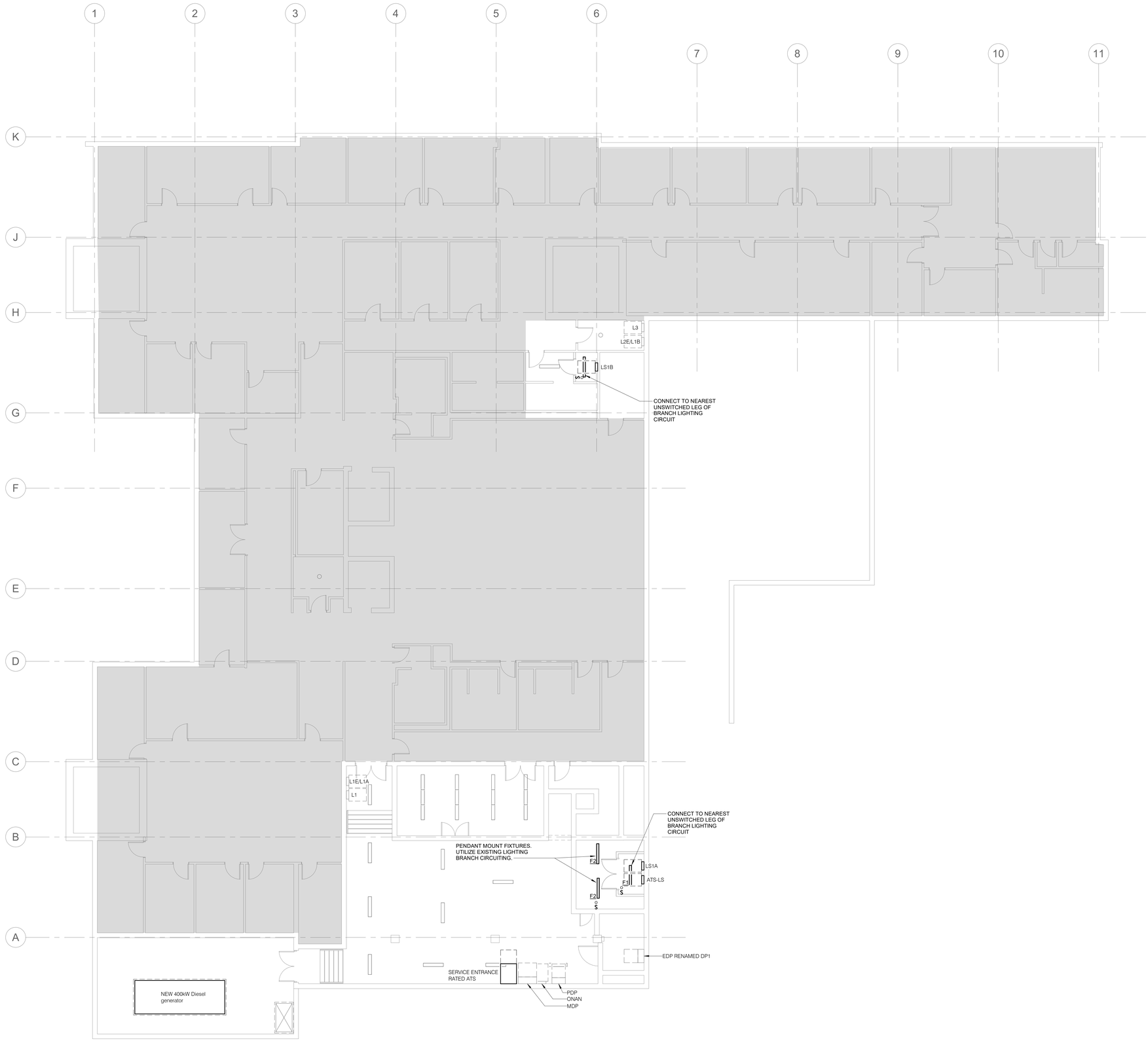
Drawing of



1 LIGHTING - FIRST FLOOR PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXXX

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Plan Name:
LIGHTING - FIRST FLOOR PLAN

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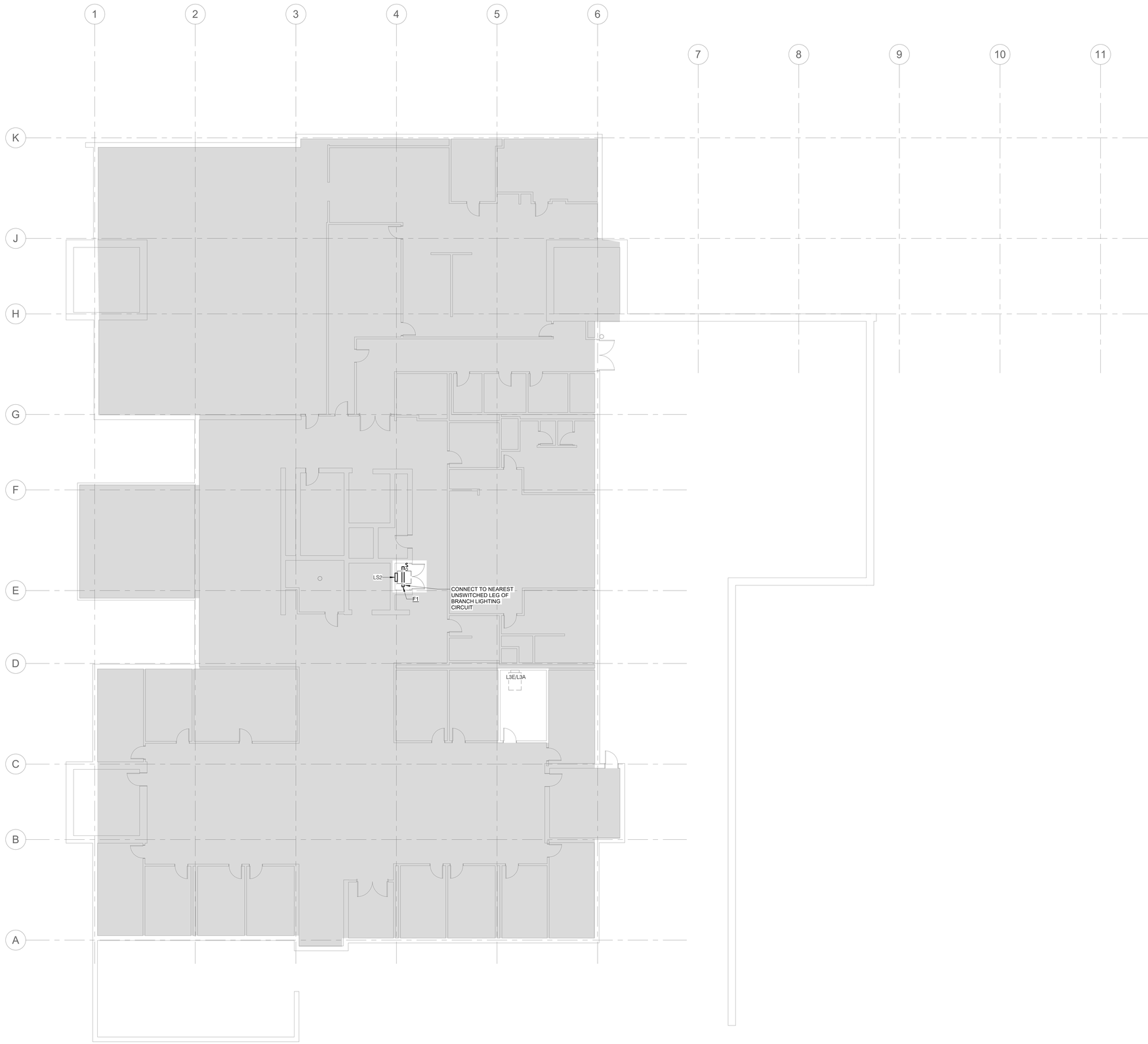

1 LIGHTING - SECOND FLOOR PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXX

Mass DMH Department of Mental Health

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No. Description Date

Plan Name:
LIGHTING - SECOND FLOOR PLAN

Drawing Number:
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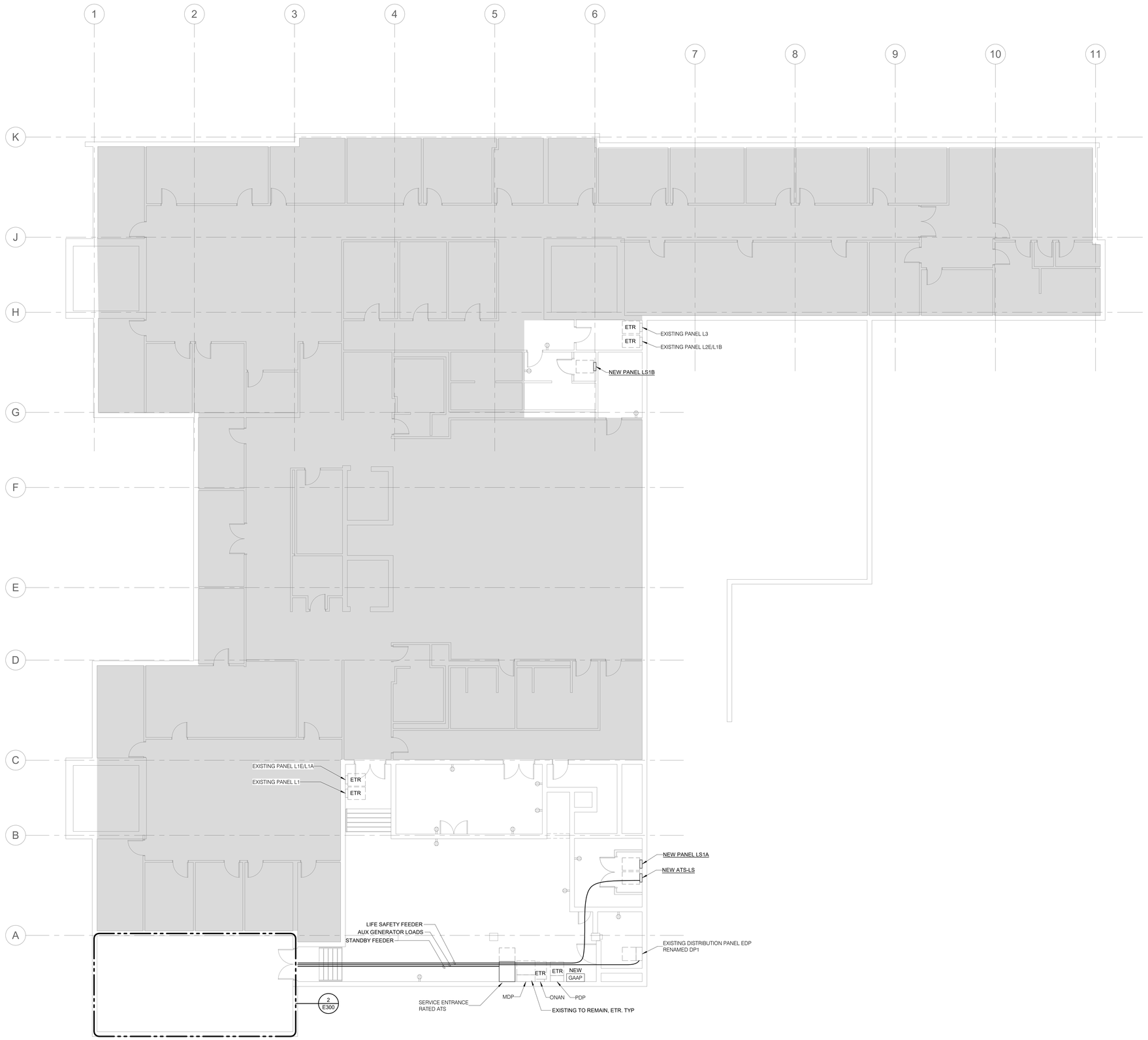

1 POWER - FIRST FLOOR PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

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Plan Name:
POWER - FIRST FLOOR PLAN

Drawing Number:
E211
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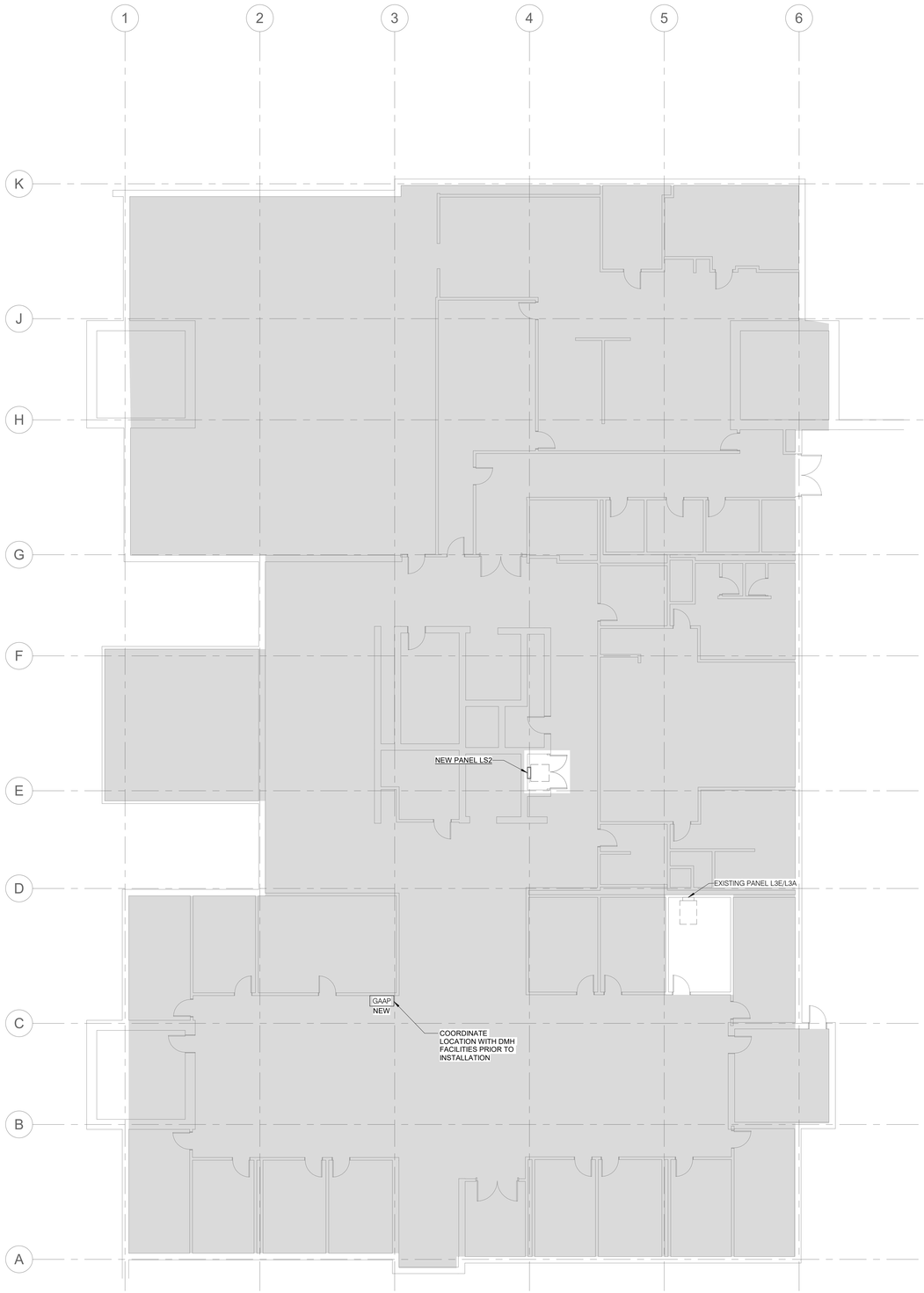
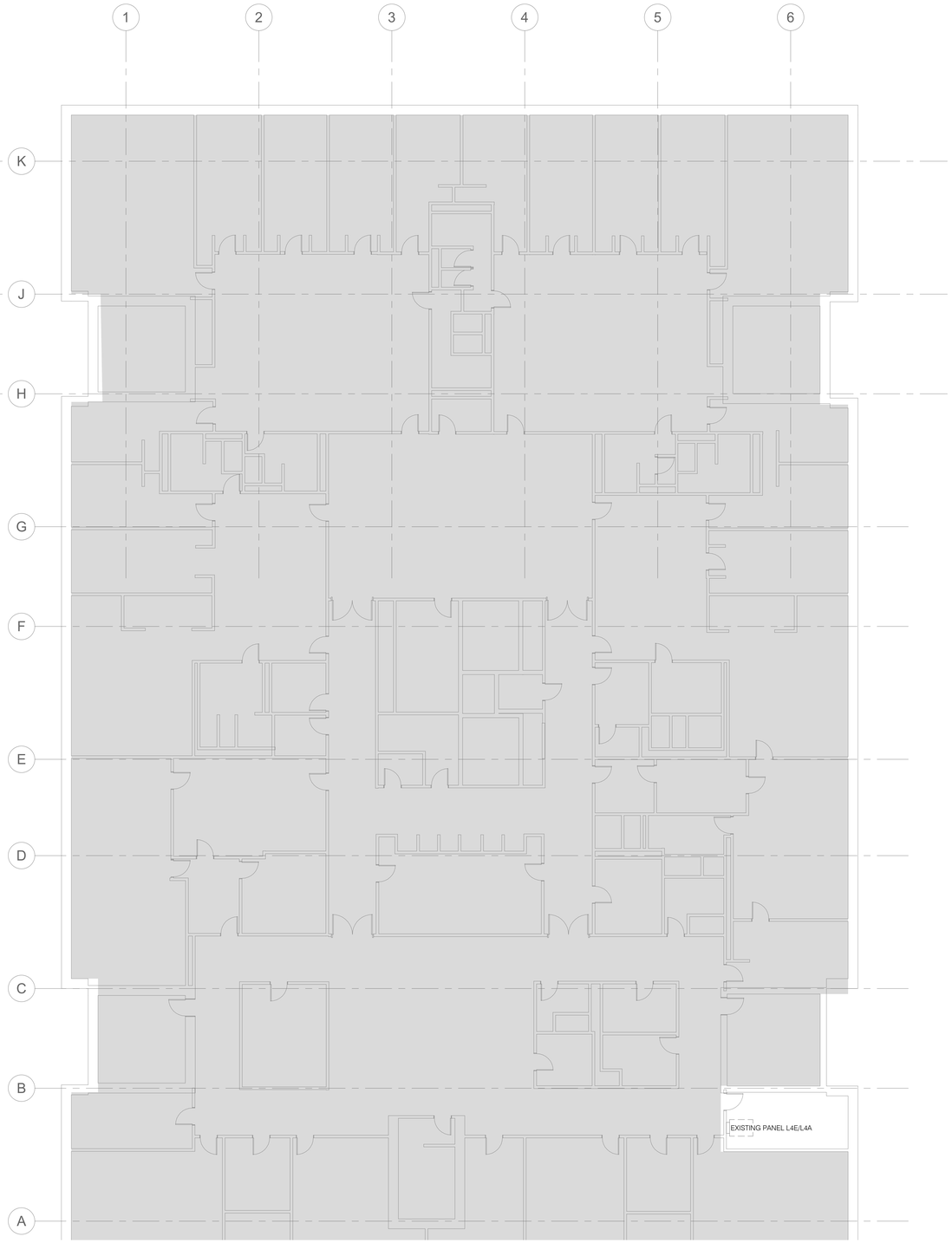


1 POWER - SECOND FLOOR PLAN

1/8" = 1'-0"



2 POWER - THIRD FLOOR PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

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IMEG Project No.: 24001755.00

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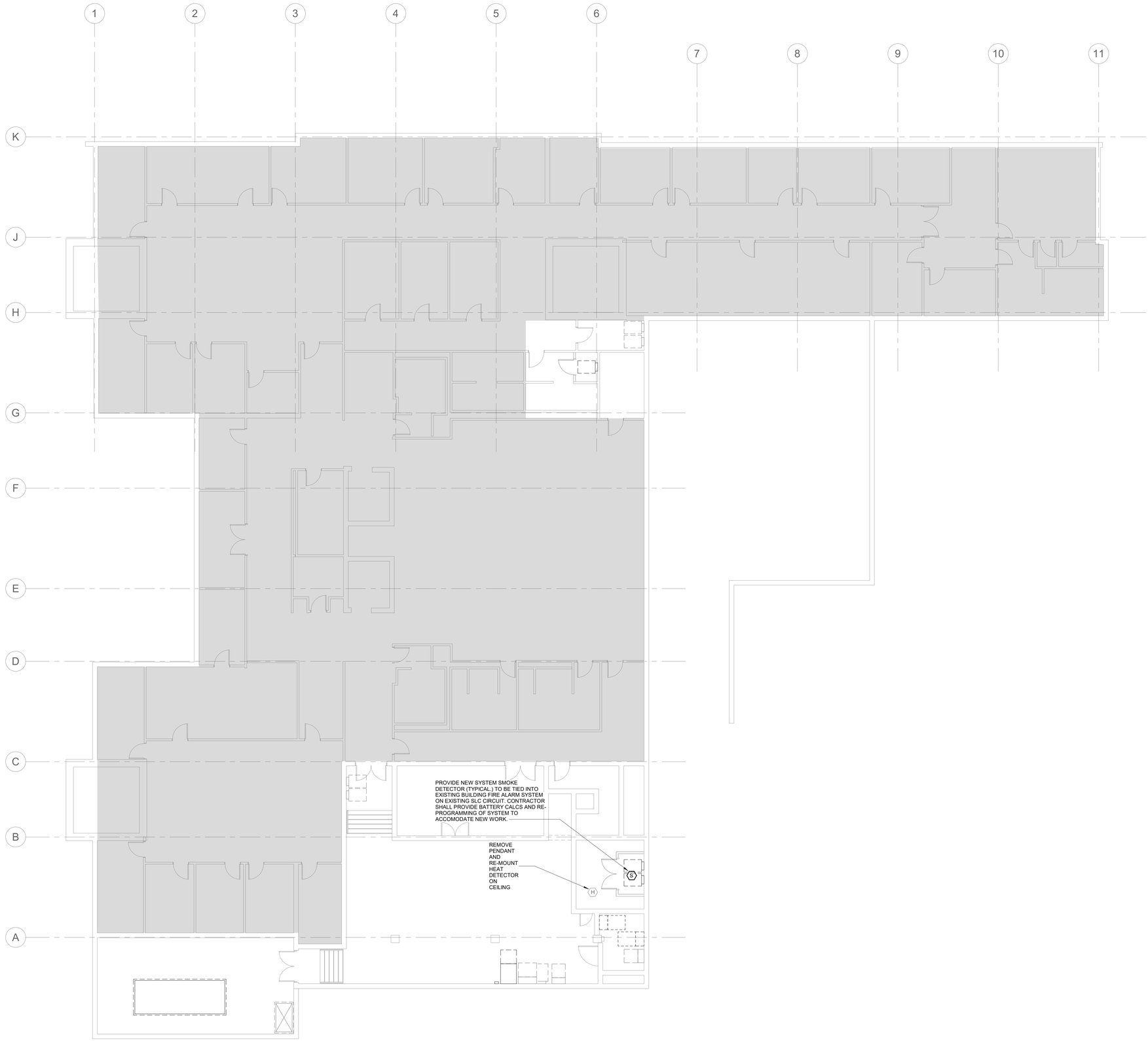
No. Description Date

Plan Name:
POWER - SECOND & THIRD FLOOR PLAN

Drawing Number:
E212
Drawing of



1 SYSTEMS - FIRST FLOOR PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

Mass DMH Department of Mental Health

Project Name:
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IMEG Project No.: 24001755.00

Project Location
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No.	Description	Date

Plan Name:
SYSTEMS - FIRST FLOOR PLAN

Drawing Number:
E221
Drawing of

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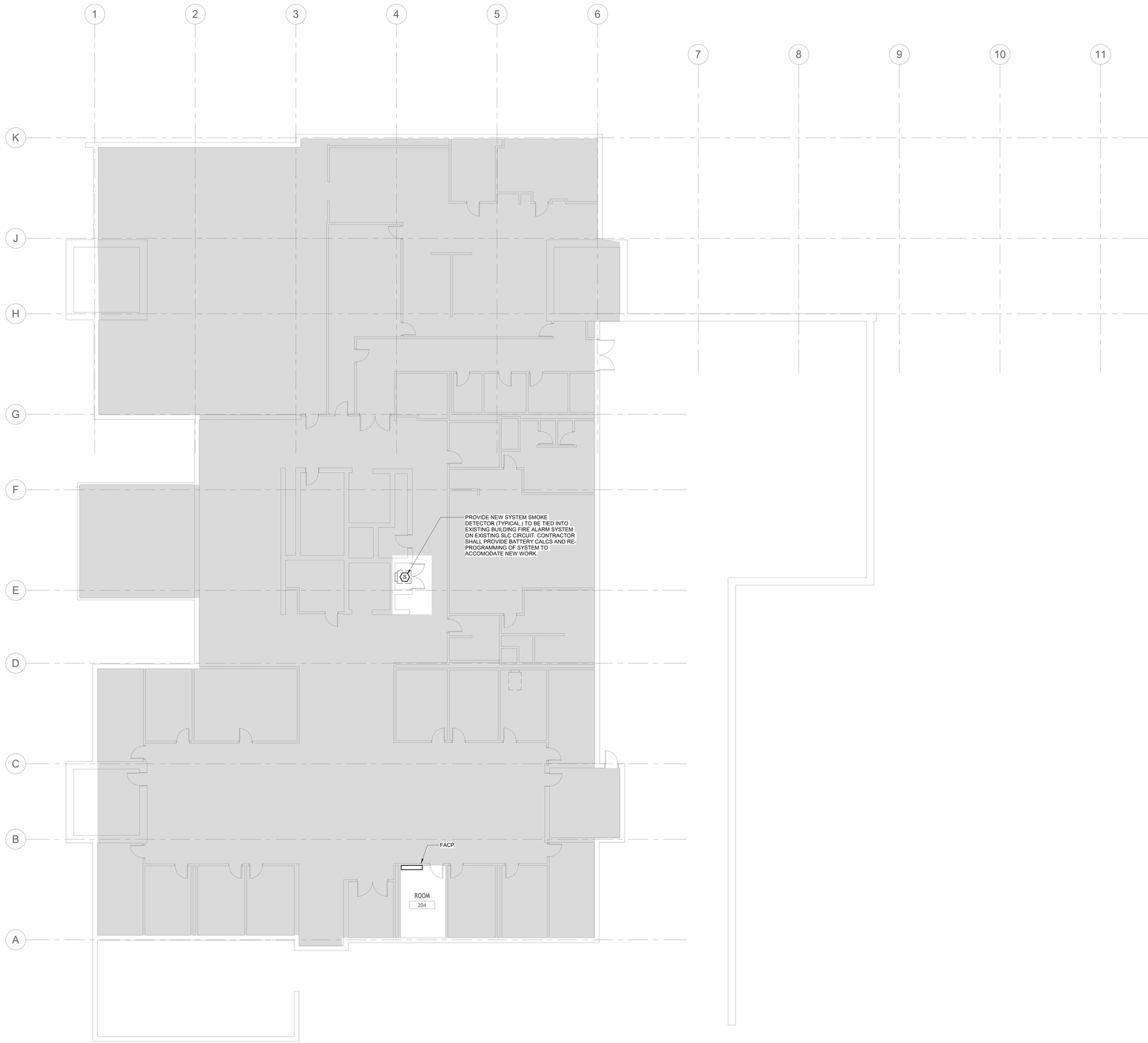

1 SYSTEMS - SECOND FLOOR PLAN

1/8" = 1'-0"

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

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1/15/2025

Revisions

No.	Description	Date

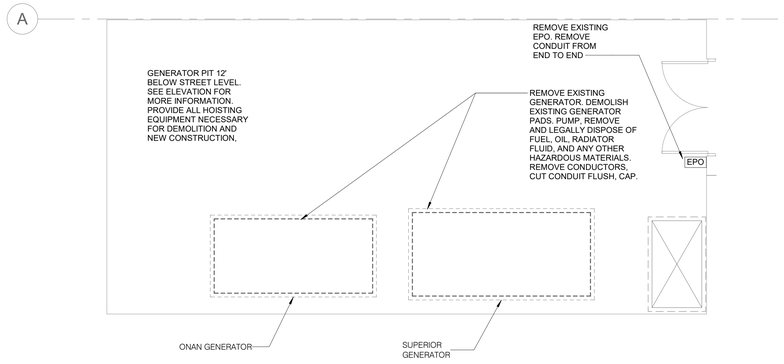
Plan Name:
SYSTEMS - SECOND FLOOR PLAN

Drawing Number:
E222
Drawing of

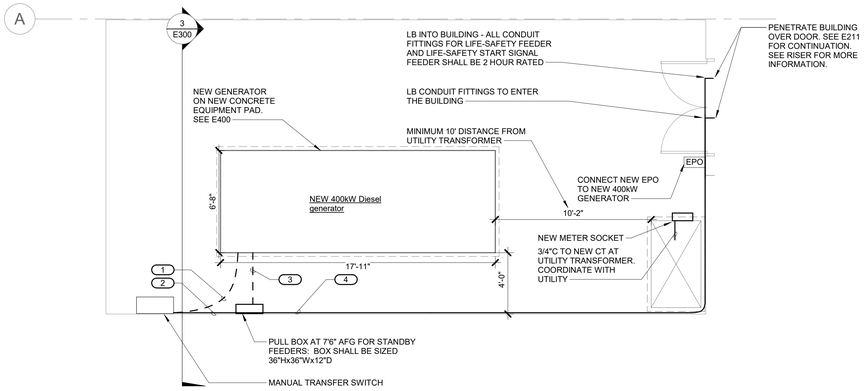
GENERAL NOTES:
1. ALL PENETRATIONS TO THE BUILDING SHALL BE FIRESTOPPED.
2. ALL CONDUIT HORIZONTAL ALONG WALL SHOULD BE RIGID METAL CONDUIT EXCEPT FOR LIFE-SAFETY CONDUITS.

KEYNOTES: (#)

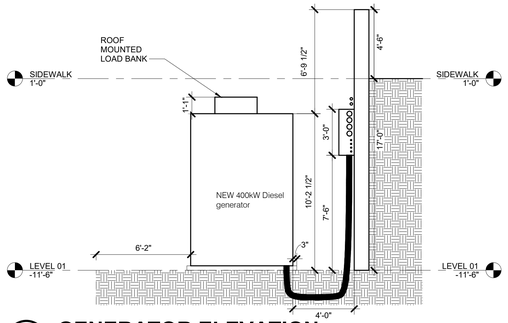
1. LIFE SAFETY DUCT BANK SEE DETAIL 2/E400:
   -LIFE-SAFETY FEEDER 2 HOUR RATED 4#1/0 & 1#6G in 2"C.
   -LIFE-SAFETY START SIGNAL 6#14 in 3/4"C.
2. LIFE SAFETY CONDUITS RUN ALONG WALL:
   -LIFE-SAFETY FEEDER 2 HOUR RATED 4#1/0 & 1#6G in 2"C. BOD - BREATHSAVER - 2HR FRE WITH 2HR XHHW
   -LIFE-SAFETY START SIGNAL 6#14 in 3/4"C. BOD - BREATHSAVER - 2HR FRE WITH 2HR XHHW
3. STANDBY BUS DUCT SEE DETAIL 1/E400:
   -AUXILIARY LOADS FEEDER: 4#6 & 1#10G in 1"C
   -STANDBY FEEDER: (3) SETS 4#600kcmil & 1#3/0-G in 4"C
   -ANNUNCIATOR PANEL FEEDER: BELDEN RS485 CABLE AND 2#12 CABLES IN 3/4"C TO EACH ANNUNCIATOR.
   -GENERATOR START TO SERVICE ENTRANCE RATED ATS 2#12 in 3/4"C
4. STANDBY FEEDERS RUN ALONG WALL. CONDUITS SHALL BE RMC:
   -AUXILIARY LOADS FEEDER: 4#6 & 1#10G in 1"C
   -STANDBY FEEDER: (3) SETS 4#600kcmil & 1#3/0-G in 4"C
   -ANNUNCIATOR PANEL FEEDER: BELDEN RS485 CABLE AND 2#12 DC IN 3/4"C TO EACH ANNUNCIATOR.
   -GENERATOR START TO SERVICE ENTRANCE RATED ATS 2#12 in 3/4"C



1 POWER - LEVEL 01 DEMOLITION PLAN - SUB GRADE COURTYARD
1/4" = 1'-0"



2 POWER - LEVEL 01 PLAN - SUB GRADE COURTYARD
1/4" = 1'-0"



3 GENERATOR ELEVATION
1/4" = 1'-0"

SCALE: 1/8" = 1' - 0"
8 6 4 2 0 8 16
N

File Path: XXXXXXXXXXX

Mass DMH Department of Mental Health

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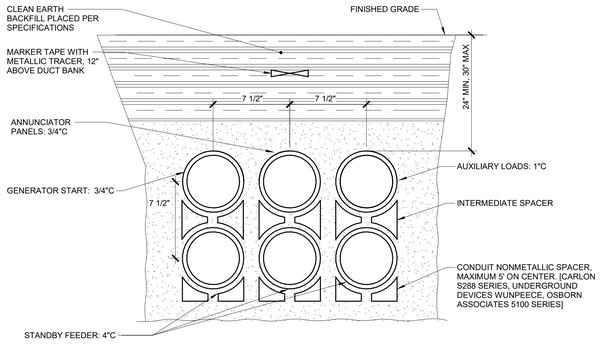
No. Description Date

Plan Name:
ELECTRICAL ENLARGED PLANS

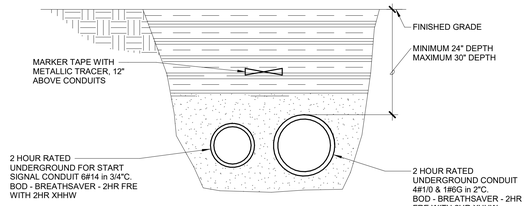
Drawing Number:
E300
Drawing of



NOTES:

1. INSTALL 2000 lb TENSILE STRENGTH BRAIDED POLYPROPYLENE PULL CORD IN ALL CONDUITS.
2. TRENCHING AND BACKFILL ACCORDING TO SPECIFICATION SECTION 26 05 00.
3. MINIMUM OF 4'-0" CLEAR BETWEEN ADJACENT DUCTBANKS.
4. DOWEL ENDS OF DUCTBANK TO FOUNDATION OR MANHOLE WITH A MINIMUM OF (4) #4 DOWELS.
5. CONDUITS IN DUCT BANK SHALL BE SCHEDULE 40 PVC.

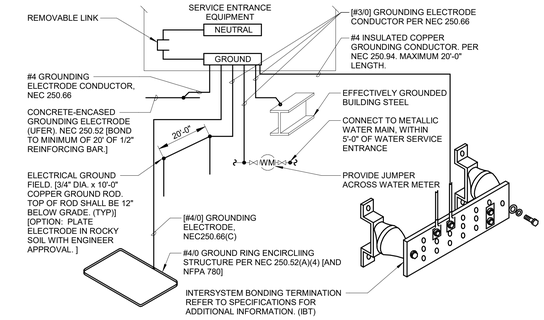
1 DUCT BANK DETAIL - STANDBY
NTS



NOTES:

1. INSTALL 2000 lb TENSILE STRENGTH PULL ROPE IN ALL EMPTY CONDUITS.
2. TRENCHING AND BACKFILL ACCORDING TO SPECIFICATION SECTION 26 05 00.

2 DUCT BANK DETAIL - LIFE-SAFETY
NTS

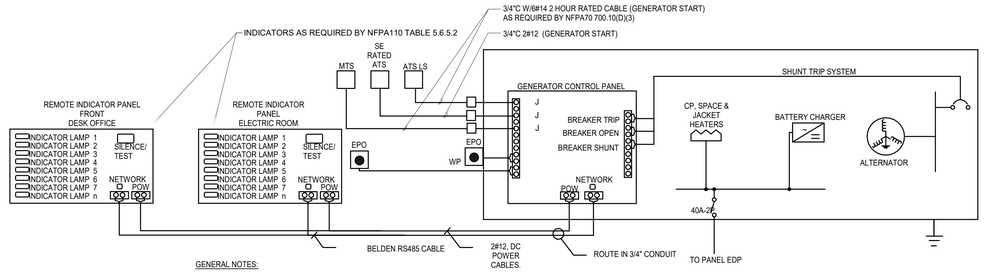


NOTE: IF EXISTING SERVICE ENTRANCE GROUND TESTS ABOVE 25 OHMS, PROVIDE NEW SERVICE ENTRANCE GROUND.

NOTES.

1. 1. REFER TO SPECIFICATION SECTION 26 05 26 GROUNDING AND BONDING

3 ALTERNATE - SERVICE ENTRANCE GROUNDING ELECTRODE SYSTEM DETAIL
NTS



GENERAL NOTES:

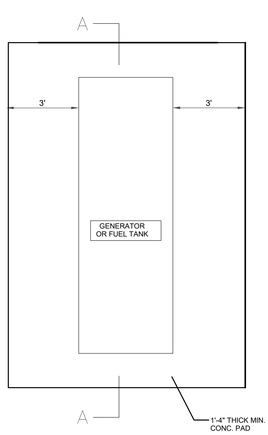
1. GENERATOR AUX CIRCUIT POWER REQUIREMENTS VARY BY MANUFACTURER. INFORMATION GIVEN IS CORRECT FOR CATERPILLAR GENERATOR. COORDINATE REQUIREMENTS WITH EQUIPMENT SUPPLIER.
2. GENERATOR TO BE PROVIDED WITH FORM-A AND BELL TYPE CONTACTS TO MONITOR FEEDER CIRCUIT BREAKER "TRIPPED" AND "OFF" POSITIONS. PROVIDE INDICATOR LIGHT SHOWING BREAKER POSITION.
3. CONNECT GENERATOR INTO BUILDING GROUNDING SYSTEM. PROVIDE 3 POLE TRANSFER SWITCHES.
4. OUTPUT CIRCUIT BREAKERS TO BE ELECTRONIC TRIP, SET TO REMOVE THE ELECTRICAL SUPPLY UNDER SHORT CIRCUIT AND OVERLOAD CONDITIONS BEFORE DAMAGE OCCURS TO THE ALTERNATOR I.E. TRIP CURVE IS COORDINATED WITH DAMAGE CURVE.
5. GENERATOR TO BE PROVIDED WITH (2) REMOTE ANNUCIATORS LOCATED IN THE FRONT DESK OFFICE AND ELECTRIC ROOM/MAINTENANCE OFFICE

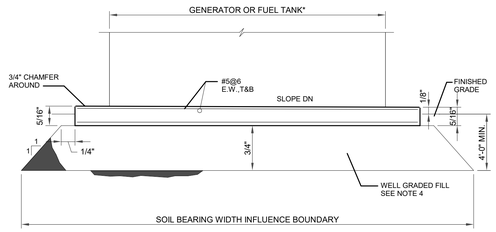
TEMPORARY POWER AND GENERATOR REQUIREMENTS

A. BACK UP GENERATION MUST BE MAINTAINED THROUGHOUT THE PROJECT. PROVIDE TEMPORARY EMERGENCY GENERATOR AS NECESSARY TO MAINTAIN GENERATOR BACKUP FOR PERIODS DURING GENERATOR REMOVAL AND INSTALLATION OF NEW GENERATOR.

B. TEMPORARY LIGHT AND POWER MUST BE PROVIDED DURING ALL SCHEDULED SHUT DOWNS. PROVIDE A MINIMUM OF TWO (2) WEEK NOTICE OF ANY UTILITY SHUTDOWN. ALL POWER DISRUPTION MUST BE ON A SATURDAY OR A SUNDAY APPROVED BY THE MSP. THE FOLLOWING AREAS MUST HAVE POWER THROUGHOUT THE PROJECT.

4 GENERATOR DETAIL
NO SCALE





SECTION A-A

SCALE: 1/4"=1'-0"

STRUCTURAL NOTES:

1. PAD LAYOUT IS BASED ON GENERATOR DIMENSIONS. ACTUAL PAD DIMENSIONS SHALL BE 6" BEYOND THE FOOTPRINT OF THE GENERATOR OR FUEL TANK.
2. STRUCTURAL WORK SHALL CONFORM TO THE EIGHT EDITION OF THE MASSACHUSETTS STATE BUILDING CODE.
3. LOCATE GENERATOR PAD NO CLOSER THAN 2 FEET AWAY FROM EXISTING BUILDING/STRUCTURE.
4. ASTERISKS (*) INDICATES DIMENSION TO BE VERIFIED WITH THE EQUIPMENT MANUFACTURER AND COORDINATED WITH ELECTRICAL DRAWINGS. COORDINATE METHOD AND LOCATION OF ATTACHMENT WITH APPROVED GENERATOR.
5. REMOVE GRASS AND TOP SOIL WITHIN THE WORK INFLUENCE BOUNDARIES.
6. BELOW THE CONCRETE PAD, PROVIDE A MINIMUM 39 INCHES OF WELL GRADED NON-FROST SUSCEPTIBLE FILL EXTENDING LATERALLY BEYOND THE LIMITS OF THE FOUNDATION CONCRETE A DISTANCE EQUAL TO THE DEPTH OF THE FILL PLUS 1 FOOT IN ALL PLAN DIRECTIONS. THE FILL SHOULD BE PLACED IN 6-INCH LIFTS, AND EACH LIFT SHOULD BE COMPACTED TO 95 PERCENT OF THE MAXIMUM MODIFIED PROCTOR DENSITY. PRIOR TO PLACING THE FILL, THE SUBGRADE SHOULD BE PROOF ROLLED WITH AT LEAST 6 PASSES OF A 5-TON VIBRATORY ROLLER.
7. NO CONCRETE SHALL BE PLACED IN WATER OR FROZEN SUBGRADE MATERIAL.
8. CONCRETE WORK SHALL CONFORM TO "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318, ACI 318R)" AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 301)".
9. UNLESS NOTED OTHERWISE, CONCRETE SHALL BE AIR ENTRAINED, NORMAL WEIGHT, 4,000 PSI 28-DAY COMPRESSIVE STRENGTH WITH A MAXIMUM SLUMP OF 4" CONFORMING TO ASTM C94. CEMENT TO BE TYPE II PORTLAND CEMENT PER ASTM C150. COARSE AND FINE AGGREGATES TO CONFORM TO ASTM C33. MID-RANGE WATER REDUCER CAN BE ADDED FOR INCREASED WORKABILITY. SUBMIT CONCRETE DESIGN MIX FOR REVIEW PRIOR TO PLACEMENT.
10. REINFORCING STEEL SHALL BE NEW BILLET STEEL CONFORMING TO ASTM A615, GRADE 60. DETAILING, FABRICATION AND ERECTION OF REINFORCEMENT TO CONFORM TO ACI 315R-18 CURRENT EDITION, ACI MANUAL SP-66, AND CRSI MANUAL OF STANDARD PRACTICE.
11. CONCRETE SURFACE TO RECEIVE LIGHT BROOM FINISH.
12. MOIST CURE CONCRETE PAD FOR MINIMUM OF 7 DAYS.
13. REQUIRED FIELD TESTING AND INSPECTION.
    - SOIL PREPARATION AND COMPACTION TESTING PER SPECIFICATION SECTION 312000.
    - INSPECTION OF REBAR PLACEMENT FOR CONFORMANCE WITH DESIGN DRAWING.
14. RESTORE TOP SOIL AND RE-SOD AFTER PAD INSTALLATION.

5 GENERATOR FUEL TANK AND PAD DETAIL
NO SCALE

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXX

Mass DMH Department of Mental Health

Project Name:
CORRIGAN MHC GENERATOR
Project No.: 2024-067A
IMEG Project No.: 24001755.00

Project Location
49 Hillside St
Fall River MA. 02720

Project Engineer
IMEG
The FUTURE. Built Smarter. www.imegcorp.com
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Project Consultant

Site Number:
CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

Revisions
No. Description Date

Plan Name:
ELECTRICAL DETAILS

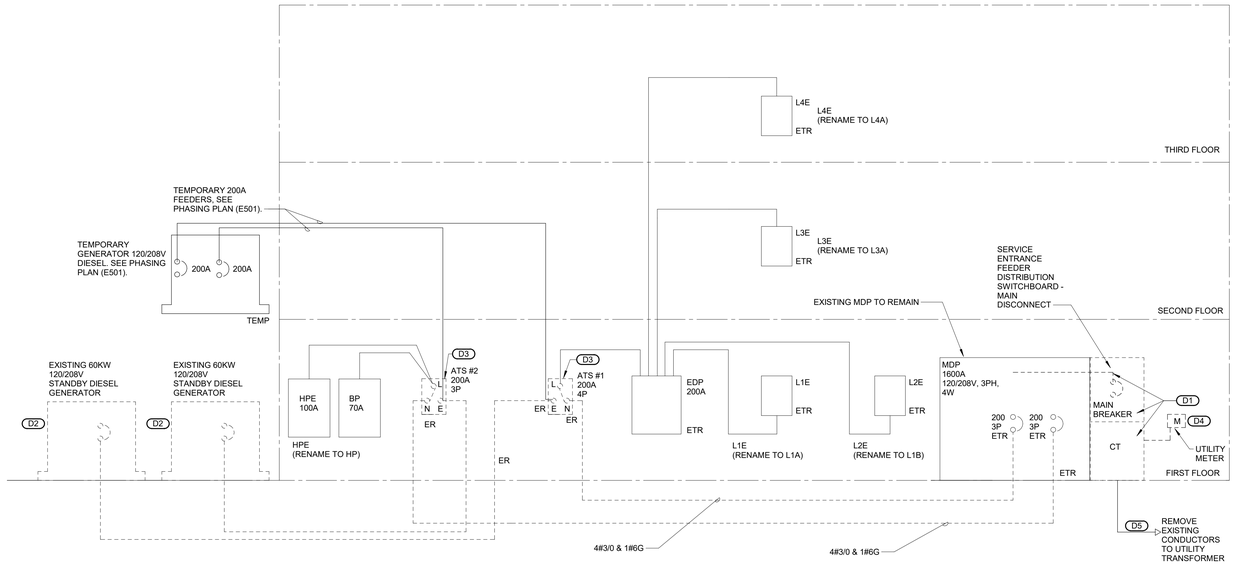
Drawing Number:
E400
Drawing of

DEMOLITION KEYNOTES: (D#)

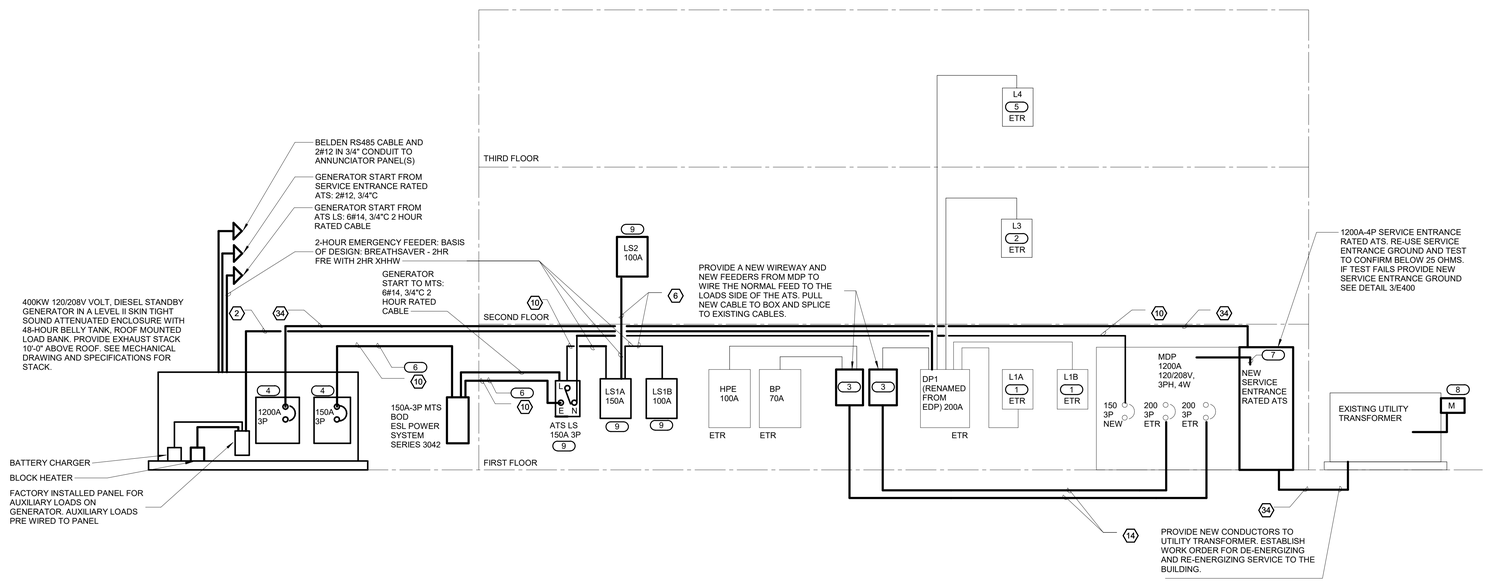
- (D1) REMOVE EXISTING CT AND MAIN BREAKER. REMOVE EXISTING FEEDS TO MDP.
- (D2) DRAIN, PUMP, REMOVE AND DISPOSE OF EXISTING GENERATOR FUEL. REMOVE EXISTING GENERATOR. DEMOLISH EXISTING GENERATOR PADS. REMOVE CONDUCTORS, CUT CONDUIT FLUSH, CAP.
- (D3) REMOVE EXISTING ATS. REMOVE EXISTING CONDUCTORS BACK TO MDP. REMOVE EXISING CONDUCTORS BACK TO GENERATOR. ESTABLISH WORK ORDER FOR DE-ENERGIZING AND RE-ENERGIZING SERVICE TO THE BUILDING.
- (D4) REMOVE EXISTING UTILITY METER AND CONDUIT TO CT.
- (D5) REMOVE CONDUCTORS BACK TO UTILITY TRANSFORMER. CONDUIT TO BE RE-USED FOR NEW CONDUCTORS FROM TRANSFORMER. ESTABLISH WORK ORDER FOR DE-ENERGIZING AND RE-ENERGIZING SERVICE TO THE BUILDING.

KEYNOTES: (#)

1. INTERCEPT ALL EMERGENCY LIGHTING CIRCUITS AND ROUTE 2#12.12G-3/4"C. TO LS1 FOR EACH CIRCUIT. SEE EMERGENCY CIRCUIT REFEEDING SCHEDULE E700.
2. INTERCEPT ALL EMERGENCY LIGHTING CIRCUITS AND ROUTE 2#12.12G-3/4"C. TO LS2 FOR EACH CIRCUIT. SEE EMERGENCY CIRCUIT REFEEDING SCHEDULE E700.
3. INTERCEPT NORMAL FEEDER, INSTALL PULLBOX, AND REPLACE 200A FEEDER WITH NEW FEEDER TERMINATING IN PANEL.
4. PROVIDE ALL BREAKERS IN SEPARATE ENCLOSURE IN GENERATOR
5. INTERCEPT ALL EMERGENCY LIGHTING CIRCUITS AND ROUTE 2#12.12G-3/4"C. TO LS2 FOR EACH CIRCUIT
6. 2-HOUR EMERGENCY FEEDER: BASIS OF DESIGN: BREATHSAVER - 2HR FRE WITH 2HR XHHW
7. NEW FEED TO MDP - (3) SETS 4#600kcmil & 1#3/0-G. CONNECT FEED TO MDP.
8. PROVIDE NEW METER SOCKET AND 3/4"C TO CT. INITIATE AND COORDINATE UTILITY WORK WITH UTILITY COMPANY.
9. PROVIDE COORDINATION STUDY FOR ALL BREAKERS ON LIFE-SAFETY BRANCH.



1 PARTIAL ELECTRICAL RISER DIAGRAM DEMOLITION
NTS



2 PARTIAL ELECTRICAL RISER DIAGRAM NEW WORK
NTS

SCALE: 1/8" = 1' - 0"

8 6 4 2 0 8 16

N

LEGEND OF FEEDER SIZES -COPPER CONDUCTORS						
FEEDER SYMBOL	CONDUCTOR (3-PHASE, 3 WIRE) WITH GROUND	RACEWAY SIZE	CONDUCTORS (3-PHASE, 4 WIRE) WITH GROUND	RACEWAY SIZE	NORMAL AMPERE RATING	SERVICE ENTRANCE GROUND
(1)	3#6 & 1#10G	3/4"			60	#8
(2)			4#6 & 1#10G	1"		
(3)	3#4 & 1#8G	1"			70	#8
(4)			4#4 & 1#8G	1-1/4"		
(5)	3#1 & 1#6G	1-1/2"			100	#8
(6)			4#1 & 1#6G	1-1/2"		
(6B)			4#4 & #6G MI CABLE			
(8)						
(9)	3#1/0 & 1#6G	1-1/2"			150	#6
(10)			4#1/0 & 1#6G	2"		
(11)	3#2/0 & 1#6G	2"			175	#4
(12)			4#2/0 & 1#6G	2"		
(13)	3#3/0 & 1#6G	2"			200	#4
(14)			4#3/0 & 1#6G	2"		
(15)	3#4/0 & 1#6G	2-1/2"			225	#4
(16)			4#4/0 & 1#6G	2-1/2"		
(17)	3#250kcmil & 1#6G	2-1/2"			250	#4
(18)			4#250kcmil & 1#6G	3"		
(19)	3#300kcmil & 1#6G	3"			300	#4
(20)			4#300kcmil & 1#6G	3"		
(21)	3#350kcmil & 1#3G	3"			350	#1/0
(22)			4#350kcmil & 1#6G	3-1/2"		
(23)	3#500kcmil & 1#3G	4"			400	#1/0
(24)			4#600kcmil & 1#6G	4"		
(25)	(2) SETS 3#250kcmil & 1#2G	(2) 2-1/2"			500	#1/0
(26)			(2) SETS 4#250kcmil & 1#2G	(2) 3"		
(27)	(2) SETS 3#300kcmil & 1#1G	(2) 3"			600	#1/0
(28)			(2) SETS 4#300kcmil & 1#1G	(2) 3"		
(29)	(2) SETS 3#500kcmil & 1#1/0G	(2) 3-1/2"			800	#1/0
(30)			(2) SETS 4#500kcmil & 1#2/0-G	(2) 4"		
(31)	(3) SETS 3#400kcmil & 1#2/0G	(3) 3"			1000	#1/0
(32)			(3) SETS 4#400kcmil & 1#2/0-G	(3) 3"		
(33)	(3) SETS 3#500kcmil & 1#2/0G	(3) 3-1/2"			1200	#1/0
(34)			(3) SETS 4#500kcmil & 1#2/0-G	(3) 4"		
(35)			(4) SETS 4#500kcmil & 1#2/0-G	(4) 4"	1600	#1/0
(36)	(5) SETS 3#600kcmil & 1#250kcmil-G	(5) 3-1/2"			2000	#1/0
(37)			(5) SETS 4#600kcmil & 1#250kcmil-G	(5) 4"		
(38)	(7) SETS 3#600kcmil & 1#400kcmil-G	(7) 3-1/2"			2000	400kcmil
(39)			(6) SETS 4#500kcmil & 1#400kcmil-G	(7) 4"		

NOTES:

1. CONDUCTOR SIZES ARE THE MINIMUM ALLOWED BASED UPON NEC TABLE 310-16 WITH NO GREATER THAN THREE CURRENT CARRYING CONDUCTORS PER RACEWAY IN AN AMBIENT NOT TO EXCEED 30 DEGREES C.
2. RACEWAY SIZES ARE THE MINIMUM ALLOWED BASED UPON NEC TABLE C1(A) FOR THWN/THWN CONDUCTORS IN EMT. RACEWAY SIZES SHALL BE INCREASED TO ACCOMODATE DIFFERING/ISOLATION SYSTEMS AND RACEWAY TYPES TO LIMIT RACEWAY FILL TO LESS THAN 40%.
3. FEEDERS DESIGNATED IN MULTIPLE SETS SHALL HAVE THE REQUIRED SETS INSTALLED IN PARALLEL.
4. 2-HOUR RATED FEEDERS FOR LIFE SAFETY (BOD VITALink MC 2-HOUR FIRE RATED POWER CABLE) DESIGNATED AS SUCH (6B 2HR)

3 FEEDER SIZES
NTS

Mass DMH Department of Mental Health

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Project No.: 2024-067A
IMEG Project No.: 24001755.00

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Project Engineer
IMEG
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Project Consultant

Site Number:
CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

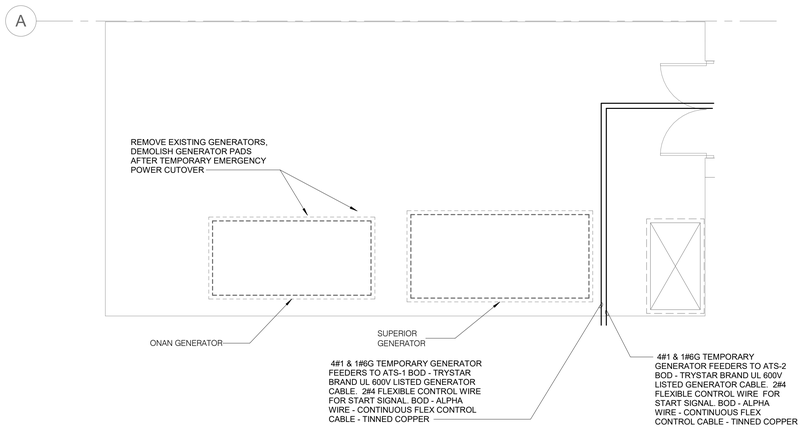
Revisions

No.	Description	Date

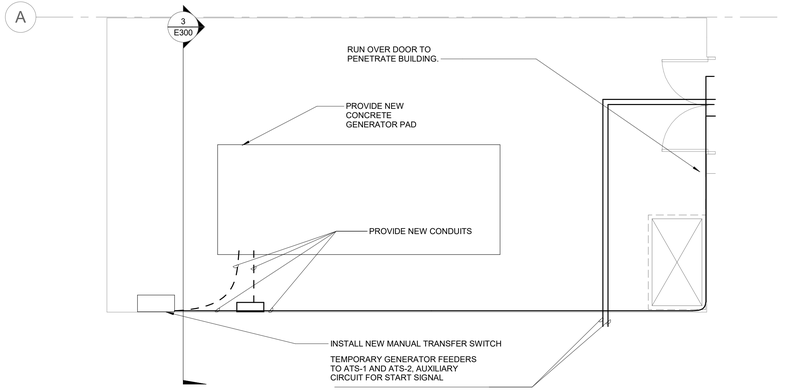
Plan Name:
ELECTRICAL DIAGRAMS

Drawing Number:
E500
Drawing of

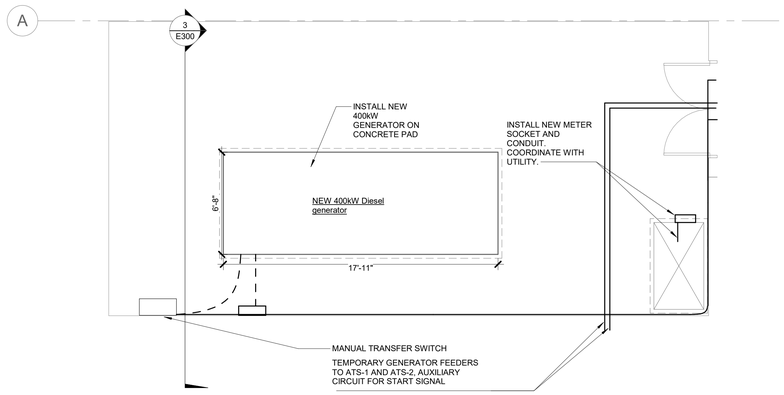
File Path: XXXXXXXXXXXX



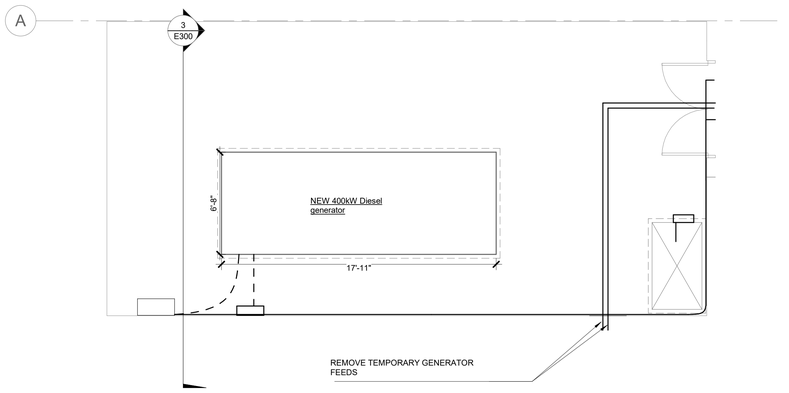
PHASE 1 NOTES:
1. NOT TO SCALE.
2. PROVIDE TEMPORARY GENERATOR AT STREET LEVEL WITH (2) 200A FEEDS TO EXISTING ATS-1 AND ATS-2. PROVIDE AUXILIARY CIRCUITS FOR TEMPORARY GENERATOR CONNECTION TO EXISTING ATS. PROVIDE WIRING AND CONECTIONS FOR GENERATOR AUTOMATIC START FUNCTION VIA ATS1 AND ATS2 CONTACT CIRCUITS. THIS WILL PROVIDE A TEMPORARY GENERATOR HOOKUP FOR THE BUILDING DURING FUTURE PHASES WHEN EXISTING GENERATORS ARE REMOVED. SEE ONE-LINE ON E500.
3. SCHEDULE PHASES IN COORDINATION WITH GENERATOR AND EQUIPMENT LEAD TIMES.
4. PROVIDE NEW WIRING AND CONDUIT FOR FUTURE GENERATOR CIRCUITS AND NEW MAIN SECONDARY SERVICE, REFER TO ONE-LINE (E500)
5. TEMPORARY EMERGENCY POWER CUTOVER: ONCE PHASE 1 TEMPORARY GENERATOR AND FEEDER IS IN PLACE AND CONFIRMED TO BE OPERATIONAL, AT ATS1 AND ATS2 THE EMERGENCY POWER SOURCE SHALL BE DISCONNECTED FROM THE RESPECTIVE EXISTING GENERATORS AND CONNECTED TO THE TEMPORARY GENERATOR. THE TEMPORARY GENERATOR SHALL HAVE AUTOMATIC START FUNCTION VIA ATS1 AND ATS2 CONTACT CIRCUITS. COORDINATE CUTOVER TIMES WITH FACILITY AND FIRE DEPARTMENT. EMERGENCY GENERATOR POWER WILL NOT BE AVAILABLE FOR THE TIME PERIOD BETWEEN CONNECTIONS.
6. ONCE TEMPORARY GENERATOR POWER IS OPERATIONAL, REMOVE EXISTING GENERATORS, DEMOLISH EXISTING GENERATOR PADS, REMOVE ASSOCIATED POWER WIRING AND CONDUIT. PREPARE AREA FOR FUTURE GENERATOR.



PHASE 2 NOTES:
1. NOT TO SCALE
2. PROVIDE PAD FOR NEW GENERATOR. ENSURE CONCRETE PAD IS ADEQUATELY SIZED FOR THE SELECTED 400kW GENERATOR ENCLOSURE AND SUB-BASE FUEL TANK.
3. PROVIDE NEW MANUAL TRANSFER SWITCH FOR NEW EMERGENCY GENERATOR FEEDER ON COURTYARD WALL. PROVIDE CONDUITS AND WIRING TO PREPARE FOR NEXT PHASES. PROVIDE SLACK IN JUNCTION BOXES TO EXTEND FOR FUTURE CONNECTIONS.
4. PROVIDE NEW LIFE-SAFETY PANELS IN DESIGNATED LOCATIONS AND COMPLETE ASSOCIATED CONDUIT RUNS AND WIRING.



PHASE 3 NOTES:
1. NOT TO SCALE.
2. INSTALL NEW 400kW DIESEL GENERATOR. GENERATOR SHALL BE IN-PLACE AND LOAD-BANK TESTED.
3. ONCE THE NEW 400kW DIESEL GENERATOR IS IN-PLACE AND CONFIRMED TO BE OPERATIONAL, CONNECTIONS SHOULD BE MADE TO THE NEW MANUAL TRANSFER SWITCH, NEW SERVICE RATED ATS, NEW ATS-LS, AND AUXILIARY CONNECTIONS SHOULD BE MADE TO EDP (RENAMED DP1) .
4. ELECTRICAL UTILITY CUTOVER: COORDINATE UTILITY SHUTDOWN AT EXTERIOR SERVICE TRANSFORMER WITH FACILITY AND UTILITY. ESTABLISH WORK ORDER FOR DE-ENERGIZING AND RE-ENERGIZING THE SERVICE TO THE BUILDING. DURING UTILITY SHUTDOWN, REMOVE THE EXISTING SERVICE ENTRANCE FEEDER DISTRIBUTION SWITCHBOARD AND INSTALL NEW SERVICE ENTRANCE RATED ATS. DURING THE UTILITY CUTOVER THE BUILDING WILL HAVE GENERATOR BACKUP VIA THE TEMPORARY GENERATOR BUT WILL NOT HAVE UTILITY POWER TO THE REST OF THE BUILDING. RESTORE UTILITY POWER UPON COMPLETION.
5. GENERATOR CUTOVER: ONCE NEW 400kW GENERATOR AND FEEDERS ARE CONFIRMED TO BE OPERATIONAL AND LOAD-BANK TESTED. DISCONNECT AND REMOVE CONNECTIONS FROM ATS #1 AND ATS #2. COMPLETE NEW GENERATOR CONNECTIONS TO MTS AND ATS-LS AND THE NEW SERVICE ENTRANCE RATED ATS. COORDINATE CUTOVER TIMES WITH FACILITY AND FIRE DEPARTMENT, EMERGENCY GENERATOR POWER WILL NOT BE AVAILABLE FOR THE TIME PERIOD BETWEEN CONNECTIONS.



PHASE 4 NOTES:
1. NOT TO SCALE
2. ONCE THE GENERATOR CUTOVER IS COMPLETED, REMOVE TEMPORARY GENERATOR, REMOVE AUXILIARY FEEDS.
3. REMOVE ATS 1 AND 2 AND ASSOCIATED WIRING AND CONTROLS WIRING.
4. REMOVE EXISTING SECONDARY SERVICE CONDUCTORS AND CONDUIT.
5. INDIVIDUAL BRANCH CIRCUITS SHALL BE PATCHED OVER TO THE NEW EMERGENCY PANELS, ONE BY ONE, USING THE CONDUITS INSTALLED IN PREVIOUS PHASES. DOWNTIMES FOR INDIVIDUAL CIRCUIT CUTOVERS SHALL BE COORDINATED WITH DMH AND FIRE DEPARTMENT.

SCALE: 1/8" = 1' - 0"
8 6 4 2 0 8 16

N

File Path: XXXXXXXXXXXX

Mass DMH Department of Mental Health

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Revisions
No. Description Date

Plan Name:
ELECTRICAL PHASING PLAN

Drawing Number:
E501
Drawing of

EMERGENCY CIRCUIT REFEEDING SCHEDULE

EXISTING PANEL	CIRCUIT #	LOAD	NEW PANEL	BREAKER	WIRING AND CONDUIT	NOTE
L1E RENAMED L1A	3	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L1E RENAMED L1A	4	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L1E RENAMED L1A	5	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L1E RENAMED L1A	6	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L1E RENAMED L1A	7	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L1E RENAMED L1A	8	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L1E RENAMED L1A	9	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L1E RENAMED L1A	10	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L1E RENAMED L1A	11	LIGHTING	LS1A	20A	2#12 & #12G IN 3/4"C	
L2E RENAMED L1B	1	LIGHTING	LS1B	20A	2#12 & #12G IN 3/4"C	
L2E RENAMED L1B	2	LIGHTING	LS1B	20A	2#12 & #12G IN 3/4"C	
L2E RENAMED L1B	3	LIGHTING	LS1B	20A	2#12 & #12G IN 3/4"C	
L2E RENAMED L1B	4	LIGHTING	LS1B	20A	2#12 & #12G IN 3/4"C	
L2E RENAMED L1B	6	LIGHTING	LS1B	20A	2#12 & #12G IN 3/4"C	
L2E RENAMED L1B	7	LIGHTING	LS1B	20A	2#12 & #12G IN 3/4"C	
L2E RENAMED L1B	8	LIGHTING	LS1B	20A	2#12 & #12G IN 3/4"C	
L3E RENAMED L3A	3	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L3E RENAMED L3A	5	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L3E RENAMED L3A	6	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L3E RENAMED L3A	7	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L3E RENAMED L3A	8	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L3E RENAMED L3A	9	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L4E RENAMED L4A	1	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L4E RENAMED L4A	2	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L4E RENAMED L4A	3	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L4E RENAMED L4A	4	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L4E RENAMED L4A	5	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L4E RENAMED L4A	6	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L4E RENAMED L4A	7	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	
L4E RENAMED L4A	8	LIGHTING	LS2	20A	2#12 & #12G IN 3/4"C	

DISTRIBUTION PANEL MDP

ENCLOSURE: NEMA PB 1
FED FROM: 0 A/0P @
LOCATION:

SOLID NEUTRAL
GROUND BUS

MAIN: 1,600 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES:

CKT	LOAD DESCRIPTION	Load	POLES	FRAME	TRIP	TYPE	ACC.	WIRE AND RACEWAY	CIRCUIT KEY
1	20 TON EAST	0 kVA	3	100 A	20 A	--	--	--	--
2	20 TON WEST	0 kVA	3	150 A	20 A	--	--	--	--
3	15 TON WEST	0 kVA	3	125 A	20 A	--	--	--	--
4	15 TON WEST	0 kVA	3	125 A	20 A	--	--	--	--
5	PANEL XP	0 kVA	3	100 A	20 A	--	--	--	--
6	**MTS**	**0 kVA**	**3**	**400 A**	**150 A**	--	--	--	--
7	SPACE	--	3	--	--	--	--	--	--
8	PANEL KP	0 kVA	3	70 A	20 A	--	--	--	--
9	PANEL NEW EDPA	0 kVA	3	200 A	20 A	--	--	--	--
10	PANEL L2	0 kVA	3	125 A	20 A	--	--	--	--
11	PANEL L5	0 kVA	3	125 A	20 A	--	--	--	--
12	PANEL L4	0 kVA	3	125 A	20 A	--	--	--	--
13	PANEL L7	0 kVA	3	150 A	20 A	--	--	--	--
14	PANEL L1	0 kVA	3	150 A	20 A	--	--	--	--
15	PANEL L3	0 kVA	3	150 A	20 A	--	--	--	--
16	SO. ELEVATOR	0 kVA	3	150 A	20 A	--	--	--	--
17	TRANSFER SWITCH	0 kVA	3	200 A	20 A	--	--	--	--
18	PANEL L6	0 kVA	3	200 A	20 A	--	--	--	--

LOAD SUMMARY (INCLUDES ALL TUBS IN THIS PANEL)

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES:

EXISTING DISTRIBUTION PANEL EDP RENAMED DP1

ENCLOSURE: NEMA PB 1
FED FROM: 0 A/0P @
LOCATION: EMERGENCY GENERATOR 6

SOLID NEUTRAL
GROUND BUS

MAIN: 225 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES:

CKT	LOAD DESCRIPTION	Load	POLES	FRAME	TRIP	TYPE	ACC.	WIRE AND RACEWAY	CIRCUIT KEY
1	PANEL BPE	0 kVA	1	70 A	20 A	--	--	--	--
2	PANEL HPE	0 kVA	1	100 A	20 A	--	--	--	--
3	HEATER 60A	0 kVA	1	60 A	20 A	--	--	--	--
4	WATER TANKS	0 kVA	1	20 A	20 A	--	--	--	--
5	**AUXILIARY GENERATOR LOADS (NOTE 1)**	**0 kVA**	**1**	**60 A**	**60 A**	--	--	--	--
6									
7									
8									
9									
10									
11									
12									

LOAD SUMMARY (INCLUDES ALL TUBS IN THIS PANEL)

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: NOTE 1: GENERATOR AUXILIARY PANEL REQUIREMENTS VARY. VERIFY CIRCUIT SIZING REQUIREMENTS WITH THE PURCHASE OFTHE GENERATOR.

EXISTING PANEL L1E/L1A

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 0 A/0P @
LOCATION:

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 70 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	WIRE SIZE N	WIRE SIZE G	VD %	A	B	C	VD %	WIRE SIZE G	WIRE SIZE N	WIRE SIZE H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
--	1	BATHROOMS C105, C106, C107	20 A	1	--	--	--		0	0			--	--	--	1	20 A	SPARE	2	--
1	3	WAITING RM. LTS.	20 A	1	--	--	--				0	0	--	--	--	1	20 A	CORR. LTS.	4	1
1	5	CORR. RAMP. LTS.	20 A	1	--	--	--				0	0	--	--	--	1	20 A	STAIRS E LTS.	6	1
1	7	STAIRS B LTS.	20 A	1	--	--	--		0	0			--	--	--	1	20 A	STAIRS F LTS. & RECEPT (1)	8	1
1	9	AUDITORIUM LTS.	20 A	1	--	--	--				0	0	--	--	--	1	20 A	STAIRS F LTS	10	1
1	11	EXIT LTS.	20 A	1	--	--	--						--	--	--	1	20 A	PA SYSTEM RM 109	12	--
							Total Load:		0.00 kVA		0.00 kVA									
							Total Amps:		0.00		0.00									

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: 1. MOVE THIS CIRCUIT TO LS1A, RENAME BREAKER AS SPARE.

EXISTING PANEL L2E/L1B

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 0 A/0P @
LOCATION:

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	WIRE SIZE N	WIRE SIZE G	VD %	A	B	C	VD %	WIRE SIZE G	WIRE SIZE N	WIRE SIZE H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
1	1	STAIRWAYG. & CORR. & EXIT LTS.	20 A	1	--	--	--		0	0			--	--	--	1	20 A	CORR. & WAITING RM. LTS.	2	1
1	3	GROUND FLR. CORR & EXIT LTS.	20 A	1	--	--	--				0	0	--	--	--	1	20 A	PLUG C120 RM LTS 120, 121	4	1
--	5	PLUG STEVENS RM CLOSET 133	20 A	1	--	--	--						--	--	--	1	20 A	STAIR C LTS.	6	1
1	7	STAIR D LTS.	20 A	1	--	--	--		0	0			--	--	--	1	20 A	EXIT LTS.	8	1
--	9	RECEPT C120	20 A	1	--	--	--				0	0	--	--	--	1	20 A	RECEPT RM C132	10	--
--	11	RECEPT C120	20 A	1	--	--	--						--	--	--	1	30 A	RECEPT RM C132	12	--
							Total Load:		0.00 kVA		0.00 kVA									
							Total Amps:		0.00		0.00									

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: 1. MOVE THIS CIRCUIT TO LS1B, RENAME BREAKER AS SPARE.

EXISTING PANEL L3E/L3A

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 0 A/0P @
LOCATION:

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	WIRE SIZE N	WIRE SIZE G	VD %	A	B	C	VD %	WIRE SIZE G	WIRE SIZE N	WIRE SIZE H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
--	1	UPS TO PRONE SYSTEM RM 204	20 A	1	--	--	--		0	0			--	--	--	1	20 A	RM 205 BED ROOM	2	--
1	3	CRISES LTS. RM 202, 203, 223	20 A	1	--	--	--				0	0	--	--	--	1	20 A	PLUG IN RM 204 & 223	4	--
1	5	LOBBY LTS.	20 A	1	--	--	--						--	--	--	1	20 A	LOBBY LTS.	6	1
1	7	COFFEE SHOP & CORR LTS.	20 A	1	--	--	--		0	0			--	--	--	1	20 A	DINING HALL LTS.	8	1
1	9	ELEV. LTS.	20 A	1	--	--	--				0	0	--	--	--	1	20 A	SECURITY ALARM KEY	10	--
--	11	FRONT DOOR POWER	20 A	1	--	--	--						--	--	--	1	20 A	SECURITY ALARM POWER	12	--
							Total Load:		0.00 kVA		0.00 kVA									
							Total Amps:		0.00		0.00									

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: 1. MOVE THIS CIRCUIT TO LS2, RENAME BREAKER AS SPARE.

EXISTING PANEL L4E/L4A

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 0 A/0P @
LOCATION:

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES:

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	WIRE SIZE N	WIRE SIZE G	VD %	A	B	C	VD %	WIRE SIZE G	WIRE SIZE N	WIRE SIZE H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
1	1	EXISTING LOAD	20 A	1	--	--	--		0	0			--	--	--	1	20 A	EXISTING LOAD	2	1
1	3	EXISTING LOAD	20 A	1	--	--	--				0	0	--	--	--	1	20 A	EXISTING LOAD	4	1
1	5	EXISTING LOAD	20 A	1	--	--	--				0	0	--	--	--	1	20 A	EXISTING LOAD	6	1
1	7	EXISTING LOAD	20 A	1	--	--	--		0	0			--	--	--	1	20 A	EXISTING LOAD	8	1
--	9	EXISTING LOAD	20 A	1	--	--	--				0	0	--	--	--	1	20 A	EXISTING LOAD	10	--
--	11	EXISTING LOAD	20 A	1	--	--	--						--	--	--	1	20 A	EXISTING LOAD	12	--
							Total Load:		0.00 kVA		0.00 kVA									
							Total Amps:		0.00		0.00									

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES: 1. MOVE THIS CIRCUIT TO LS2, RENAME BREAKER AS SPARE.

NEW PANEL LS1A

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 0 A/0P @
LOCATION:

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 150 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES: PROVIDE PANEL WITH INTEGRATED SURGE PROTECTION DEVICE.

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	WIRE SIZE N	WIRE SIZE G	VD %	A	B	C	VD %	WIRE SIZE G	WIRE SIZE N	WIRE SIZE H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
--	1	WAITING RM LTS.	20 A	1	--	--	--		0	0				--	--	1	20 A	CORR. LTS.	2	--
--	3	CORR. RAMP. LTS.	20 A	1	--	--	--				0	0		--	--	1	20 A	STAIRS E LTS.	4	--
--	5	STAIRS B LTS.	20 A	1	--	--	--						0	0		--	--	--	1	20 A	STAIRS F LTS. & RECEPT (1)	6	--
--	7	AUDITORIUM LTS.	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	STAIRS F LTS	8	--
--	9	EXIT LTS.	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	SPARE	10	--
--	11	SPARE	20 A	1	--	--	--						0	0		--	--	--	1	20 A	SPARE	12	--
--	13	SPARE	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	SPARE	14	--
--	15	SPARE	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	SPARE	16	--
--	17	SPARE	20 A	1	--	--	--						0	0		--	--	--	1	20 A	SPARE	18	--
--	19	SPARE	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	SPARE	20	--
--	21	SPARE	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	SPARE	22	--
--	23	SPARE	20 A	1	--	--	--						0	0		--	--	--	1	20 A	SPARE	24	--
							Total Load:		0.00 kVA		0.00 kVA									
							Total Amps:		0.00		0.00									

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES:

NEW PANEL LS1B

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 100 A/3P @ LS1A
LOCATION:

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES: PROVIDE PANEL WITH INTEGRATED SURGE PROTECTION DEVICE.

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	WIRE SIZE N	WIRE SIZE G	VD %	A	B	C	VD %	WIRE SIZE G	WIRE SIZE N	WIRE SIZE H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
--	1	STAIRWAYG. & CORR. & EXIT LTS.	20 A	1	--	--	--		0	0				--	--	1	20 A	CORR. & WAITING RM. LTS.	2	--
--	3	GROUND FLR. CORR & EXIT LTS.	20 A	1	--	--	--				0	0		--	--	1	20 A	PLUG C120 RM LTS 120, 121	4	--
--	5	STAIR D LTS.	20 A	1	--	--	--						0	0		--	--	--	1	20 A	STAIR C LTS.	6	--
--	7	EXIT LTS.	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	SPARE	8	--
--	9	SPARE	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	SPARE	10	--
--	11	SPARE	20 A	1	--	--	--						0	0		--	--	--	1	20 A	SPARE	12	--
--	13	SPARE	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	SPARE	14	--
--	15	SPARE	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	SPARE	16	--
--	17	SPARE	20 A	1	--	--	--						0	0		--	--	--	1	20 A	SPARE	18	--
--	19	SPARE	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	SPARE	20	--
--	21	SPARE	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	SPARE	22	--
--	23	SPARE	20 A	1	--	--	--						0	0		--	--	--	1	20 A	SPARE	24	--
							Total Load:		0.00 kVA		0.00 kVA									
							Total Amps:		0.00		0.00									

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES:

NEW PANEL LS2

MOUNTING: SURFACE
ENCLOSURE: NEMA 1
FED FROM: 100 A/3P @ LS1A
LOCATION:

SINGLE TUB
SOLID NEUTRAL
GROUND BUS

MAIN: 100 A MCB
VOLTS: 120/208 Wye
PHASE: 3
WIRE: 4
SCCR: 65 kA
ISC UNKNOWN 0.00 kA

NOTES: PROVIDE PANEL WITH INTEGRATED SURGE PROTECTION DEVICE.

KEY	CKT NO.	LOAD DESCRIPTION	OCPD AMPS	P	WIRE SIZE H	WIRE SIZE N	WIRE SIZE G	VD %	A	B	C	VD %	WIRE SIZE G	WIRE SIZE N	WIRE SIZE H	P	OCPD AMPS	LOAD DESCRIPTION	CKT NO.	KEY
--	1	CRISIS LTS. RM 202,203,223	20 A	1	--	--	--		0	0				--	--	1	20 A	LOBBY LTS.	2	--
--	3	LOBBY LTS.	20 A	1	--	--	--				0	0		--	--	1	20 A	DINING HALL LTS.	4	--
--	5	COFFEE SHOP & CORR LTS.	20 A	1	--	--	--						0	0		--	--	--	1	20 A	LIGHTING FROM L4E/L4A	6	--
--	7	ELEV. LTS	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	LIGHTING FROM L4E/L4A	8	--
--	9	LIGHTING FROM L4E/L4A	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	LIGHTING FROM L4E/L4A	10	--
--	11	LIGHTING FROM L4E/L4A	20 A	1	--	--	--						0	0		--	--	--	1	20 A	LIGHTING FROM L4E/L4A	12	--
--	13	LIGHTING FROM L4E/L4A	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	LIGHTING FROM L4E/L4A	14	--
--	15	SPARE	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	SPARE	16	--
--	17	SPARE	20 A	1	--	--	--						0	0		--	--	--	1	20 A	SPARE	18	--
--	19	SPARE	20 A	1	--	--	--		0	0				--	--	--	--	--	1	20 A	SPARE	20	--
--	21	SPARE	20 A	1	--	--	--				0	0		--	--	--	--	--	1	20 A	SPARE	22	--
--	23	SPARE	20 A	1	--	--	--						0	0		--	--	--	1	20 A	SPARE	24	--
							Total Load:		0.00 kVA		0.00 kVA									
							Total Amps:		0.00		0.00									

LOAD SUMMARY

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	TOTALS*	
				TOTAL CONNECTED LOAD:	0.00 kVA
				TOTAL ESTIMATED DEMAND LOAD:	0 kVA
				TOTAL CONNECTED AMPS:	0.00 A
				TOTAL ESTIMATED DEMAND AMPS:	0 A

*TOTAL DEMAND CALCS SUBTRACT ANY REDUNDANT LOAD AND THE SMALLER OF ANY NONCOINCIDENT HVAC LOADS. THIS CALC IS DONE AT EACH PANEL.

CIRCUIT KEY NOTES:

Mass DMH Department of Mental Health

Project Name:
CORRIGAN MHC GENERATOR
Project No.: 2024-067A
IMEG Project No.: 24001755.00

Project Location
49 Hillside St Fall River MA. 02720

Project Engineer
IMEG
The FUTURE. Built Smarter www.imegcorp.com
10 FRANKLIN STREET
BOSTON, MA 02110
P: 617.542.0810

Project Consultant

Site Number:
CAMIS Number:
Building Number:
Secretariat:

Original Issue Date
1/15/2025

Revisions

No.	Description	Date

Plan Name:
ELECTRICAL PANEL SCHEDULES

Drawing Number:
E700
Drawing of

File Path: XXXXXXXXXXXX