SECTION 01 01 00

SUMMARY OF WORK

PART 1 – GENERAL

1.1 CONTRACT DOCUMENTS

A. The Contract Documents include the Drawings as enumerated on the Title Drawing, the general provisions of Contract, including General and Supplemental Conditions, and the provisions of this Project Manual and Addenda as a whole represent and describe the work and requirements of the Project.

1.2 GENERAL REQUIREMENTS

A. Attention is directed to the general and supplementary conditions and Division 1 including all sub-divisions therein attached in this document and drawings, which are made a part of this section.

1.3 SUBSTANTIAL COMPLETION

A. The Date of Substantial Completion shall be as July 31st, 2023. Replacement of the domestic hot water heaters with associated work shall be the priority effort with the replacement of the boiler and circulating pumps with associated work following. The intent is to have the water heaters replaced as soon as possible.

1. The Date of Substantial Completion shall remain the same, as stated above, regardless of any alternate(s) chosen to be included in the Contract by the Owner.

B. The Contractor shall obtain a Certificate of Occupancy on or before the Date of Substantial Completion.

1.4 PROJECT DESCRIPTION

A. The project scope generally includes replacement of boiler, water heaters and any other related work necessary to complete all the Work of the respective Sections and indicated on the drawings.

1. Temporary chiller replacement with associated natural gas and water piping, flues, power and fire alarm wiring and controls along with miscellaneous concrete work for extension of existing pads.

1.5 RELATED WORK UNDER OTHER CONTRACTS

A. Work by other contractors, which will be under separate contract, may take place during the work of this contract adjacent to and within work areas of this site

B. Cooperate fully with other contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this contract.

1.5 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies; perform demolition work in accordance with applicable rules, regulations, codes, and ordinances of local, state, and federal authorities.

B. Obtain and pay for necessary building permits, licenses and certificates and give notices as required during the performance of the Work.

C. Provide 4 copies of shop drawings and literature for Architects review and approval for the items referenced in the specifications.

D. Provide schedule and work plan within one week of the contract signing.

E. Attend weekly meetings (or as scheduled) with the Architect and Owner's Representative as scheduled.

F. Provide all Closeout documents including final acceptance, warranties, guaranties, and bonds.

1.6 RELATED WORK UNDER OTHER CONTRACTS

A. Work by other contractors, which will be under separate contract, may take place during the work of this contract adjacent to and within the work areas of this site. This work, under another contract, shall be coordinated between the different General Contractors. The security system will be installed by the Owner under separate Contract and the general Contractor shall work with the Owners vendor to coordinate their work with the General contractor's work.

B. Cooperate fully with separate contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying the work under this contract.

1.7 WORK SEQUENCE SCHEDULING AND COORDINATION

A. The Work shall be sequenced, scheduled, and coordinated to achieve the Date of Substantial Completion.

1. All deliveries must be scheduled at a minimum of 48 hours in advance with the Architect and Owner.
2. All existing utility tie-ins must be scheduled and coordinated at a minimum of 72 hours in advance with the Architect and Owner.

B. The General Contractor and each Sub-Contractor shall establish and increase or decrease as appropriate the workforce, days of work, number of shifts, work hours, materials, tools and equipment needed to maintain and achieve the Date of Substantial Completion.

C. The General Contractor and each Sub-Contractor shall increase the workforce, days of work, number of shifts, work hours, materials, tools, and equipment needed to maintain the Date of Substantial Completion as necessary to accommodate any additional work authorized by Construction Change Directives and Change Orders modifications.

D. General Contractor will be responsible for the proper conduct of the work to ensure that all trades work together, and in harmony, to achieve substantial and final completion as specified.

1.8 WORK HOURS

A. Normal working hours are to be Monday through Friday from 7:00 AM to 3:30 PM, except Legal Holidays. Any working hours outside of these times shall be considered "Extended Hours" and treated as described below.

B. Extended work hours shall require prior scheduling and coordination with the Architect and Owner at a minimum of 48 hours in advance. Extended work hours on Sundays and Legal Holidays may also require a permit from the Police Department.

1. Upon permission from the Architect and Owner, and prior to the start of any extended work, pay for all fees and obtain through the City of Worcester Police Department a work permit for all Sundays and Legal Holidays.

C. The Contractor shall pay any overtime required for the City's Clerk of Works/Owner's Representative to be on site for any work performed outside of normal working hours as defined above. No work shall take place outside of normal working hours without prior approval and the City's Clerk of Works/Owner's Representative on site.

D. Any project related activities may not interfere with the enjoyment and use of abutting areas within the building or adjacent properties during any extended work hours.

1.9 CONTRACTOR USE OF THE PREMISES

A. The General Contractor shall have use of the site from date of contract to the Date of Substantial Completion as described above in the Work Hours paragraph.

B. Construction vehicle access and deliveries to the project shall be made during working hours.

C. All contractor personnel shall enter and exit the construction area through Access Driveway.

D. Do not close or obstruct the parking lot, driveways, or sidewalks without the proper permit. Conduct operations with minimum traffic interference.

E. The General Contractor shall also be responsible for returning the public areas adjacent to each work area to their original state prior to the start of work in that area.

F. The use of internal combustion engine driven power equipment is prohibited within the building. Alternate power sources, i.e., generators and compressors, may be placed outside the building to provide power to equipment. Placement of any alternate power sources shall be subject to prior Architect and Owner approval.

G. There will be no washing of any vehicles at the project site. The contractor shall make necessary provisions to accommodate this work off site.

H. All cleaning and washing of tools and/or equipment shall be performed in areas designated only by the Architect. This will be strictly enforced.

1.10 CONTRACTOR USE OF CITY STREETS

A. The General Contractor's personnel, and all other personnel employed on the project, shall limit their parking on the site to within the areas designated for construction parking and as permitted by the General Contractor. Additionally, Contractor personnel may park as legally allowed within City Limits. Parking on street sidewalks is prohibited.

B. Driveway entrances, walks, and yards to abutting properties shall be kept unobstructed all times.

1.11 WORK CONDITIONS

A. Neither the General Contractor, nor Sub-Contractors at any level, nor their employees shall bring illegal substances or alcoholic beverages on the premises.

B. Vulgar, abusive, obscene language or behavior will not be tolerated.

C. The Contractor's personnel engaging in the above shall be removed from the jobsite.

D. Radios or any type of "music" broadcasting systems are not allowed.

E. This site is smoke-free; therefore, smoking is prohibited within the site limits.

1.12 PROJECT MANAGER, SUPERINTENDENTS, FIELD ENGINEER, AND FOREMAN

A. The General Contractor shall provide a qualified General Superintendent, who shall be present, full time, on site daily during all work in progress until the Date of Substantial Completion, and for such additional time thereafter as the Architect may determine. Only under extenuating circumstances, with the approval of the Architect and Owner, will the Contractor be allowed to substitute for the General Superintendent prior to the date of Final Completion.

B. The General Superintendent shall supervise and direct the activities of other superintendents and foremen on site. He shall not perform the work of foremen, tradesmen, or home office staff.

C. Each filed sub-bidder and each subcontractor shall provide a Lead Foreman, responsible to be on site full time during the workday.

D. Each foreman, in addition to his regular duties shall be responsible for establishing, maintaining, and providing record drawings, which are required to be updated prior to submitting the current period's draft Application for Payment.

E. The General Superintendent and Lead Foreman shall not be discharged or changed without prior written consent of the Architect, which will not be unreasonably withheld. The Architect will require that all as-built information be updated and current prior to granting consent.

1.13 DAILY REPORTS AND WEEKLY OUTLINE SCHEDULE

A. The General Superintendent shall provide a "Daily Report" to the Clerk of Works containing the following:

1. Name and manpower of each Contractor filed Sub-Contractor, and Sub Contractor.
2. Equipment used.
3. Delivery of products received on site.
4. Weather conditions at start, and end of each day and any significant changes or events during the day.
5. Significant problems, hazards or accidental injury occurring during each shift.
6. Summary of progress made each day.

B. A photocopy may be made of the same "Daily Report," containing the information above, that is used by the General Superintendent. The General Superintendent may obscure confidential portions of his "Daily Report" if desired. Reports are due the following day.

C. The Superintendent shall provide the Clerk of Works a written “Weekly (look ahead) Outline Schedule” of work activities planned at the beginning of each week, for that week. The “Weekly Outline Schedule” may be a simple listing of each trade’s activities delineating areas where work is to be scheduled. Note any significant milestones.

1.14 CERTIFICATE OF SUBSTANTIAL COMPLETION

A. The Architect shall issue a Certificate of Substantial Completion for the work when and if all the following conditions have been met:

1. The work is sufficiently complete to allow the Owner beneficial use of the premises. The work remaining to be done is not a danger to the proposed occupants and is of a minor nature.
2. The work is sufficiently complete that the Architect may make affidavits to the Building Official as required by Controlled Construction provisions of the Building Code.
3. The mechanical and electrical systems are fully operational. Required inspections and tests have been successfully completed, and the Owner has been provided instructions regarding operation and maintenance of mechanical and electrical systems in the building.
4. The Contractor has made notifications required to pay cost of final billing for utilities and termination of property insurance.
5. The Owner has made notifications required to assume the future cost of utilities and provide property insurance.
6. The Building Official has issued a Certificate of Occupancy without restrictions or conditions relating to the contractor’s work.

1.15 CITY OF WORCESTER ORDINANCES, LICENSES, PERMITS, AND FEES

A. All Contractors shall comply with City Ordinances which may affect the work of this contract, and which have not been previously covered in the Contract Documents. Requirements and fees listed are those in effect as of this writing and each Contractor shall be responsible for verifying the requirements and fee cost as currently in effect and throughout the duration of this project. This includes, but is not limited to, the following:

1. Worcester Police Department:
   a. Police Details
      Hourly rate for one-half day or full day.
   b. Permits for Sunday and Holiday work.
      Fee Required.
2. Department of Public Works, Permits Division
   a. Street Opening Permit Bond
      $ 5,000.00
   b. Barricade Placement by DPW
      1st $85 per day
      Each additional $ 40 per day

c. Drainlayers License
New $ 200.00
Annual Renewal $ 100.00

d. Drain Permit
$ 180.00

e. Main Inspection
$ 2.90 per Foot

f. Assessment
To be Determined

g. Plan Review
$ 100.00

h. Street Obstruction
$ 150.00 each

i. Street Obstruction (Blanket Permit)
$ 1,000.00 per year

j. Street Opening
Pavement older than 5 years $ 156.00
Pavement 5 years old or less $ 300.00

k. Driveway Opening
Permit $ 156.00

l. Wastewater Discharge
Permit $ 250.00
Inspection $ 400.00
Sewer uses $ 6.29/CCF

m. Water meter, etc. Contact the Water Department at 508-799-1492.

n. Traffic and Parking. Contact Department at 508-799-1468.

3. Worcester Fire Department
   a. Fire and Smoke Alarm
   b. Automatic Sprinkler and Standpipes
   c. Contact Worcester Fire Department at 508-799-1826.

4. Department of Inspectional Services
   a. Building Permit
   Based on total contract price
   $11/$1,000 up to the first million dollars.
   $8.00 per each $1,000.00 over $1,000,000.
   Orders of Building Official under Chapter 1, 780 CMR.
   Ticket violation under Chapter 33, 780 CMR.

   b. Trash Control
   Ticket for Violations

   c. Environmental Control
   Air, Water, Noise Pollution - Ticket for Violations
   Conservation Commission Enforcement Officer

1.17 UTILITY COMPANY BACKCHARGES

A. The Electric back charge from N-GRID or Verizon Communications are not known at this time, the Electrical Contractor shall file for all N-Grid and Verizon permits and submit all data and documents as required, and shall pay the required permit and inspection fees. The actual cost of the N-Grid back charge shall be paid by the City directly. All related inspection costs or other fees shall be paid as part of the Contract.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 04 50

CUTTING AND PATCHING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made a part of this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for cutting and patching work not specified elsewhere.

B. Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

1. Requirements of this Section apply to all Sections of the Specifications, including mechanical and electrical installations.

C. Any finished new work required to be cut out due to lack of coordination and scheduling, will be repaired by the trade causing cutting and patching to be done. This work will be done at no additional cost to the Owner.

1.3 SUBMITTALS

A. Cutting and Patching Proposal: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures seven (7) days in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:

B. Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.

1. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
2. List products to be used and firms or entities that will perform Work.
3. Indicate dates when cutting and patching will be performed.
4. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
5. Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.
6. Approval by the Architect to proceed with cutting and patching does not waive the Architect's right to later require complete removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following structural elements:

a. Foundation construction.
b. Bearing walls.
c. Structural concrete.
d. Lintels.
e. Structural decking.
f. Miscellaneous structural metals.
g. Piping, ductwork, and equipment.

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increased maintenance, or decreased operational life or safety.

1. Obtain approval of the cutting and patching proposal before cutting and patching the following operating elements or safety related systems:

a. Primary operational systems and equipment.
b. Air or smoke barriers.
c. Water, moisture, or vapor barriers.
d. Membranes and flashing.
e. Control systems.
f. Communication systems.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

1. If possible, retain the original installer or fabricator to cut and patch the following categories of exposed Work, or if it is not possible to engage the original installer or fabricator, engage another recognized experienced and specialized firm:

a. Acoustical ceilings.
b. Carpeting.
c. Vinyl flooring.

1.5 WARRANTY

A. Existing Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with material in such a manner so as not to void any existing warranties.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 20 00

PROJECT MEETINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made a part of this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:
   1. Pre-Construction Conference.
   2. Pre-Installation Conference.
   3. Bi-Weekly Progress Meetings.
   4. Coordination Meetings.
   5. Project Closeout Conference.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 1 Section 01 29 00 “Applications for Payment” for procedures on submitting requisitions.
   2. Division 1 Section 01 31 00 “Project Coordination” for procedures for coordinating project meetings with other construction activities.
   3. Division 1 Section 01 33 00 “Submittal Procedures” for submitting the Contractor's Construction Schedule.
   4. Division 1 Section 01 77 00 “Project Closeout” for procedures and issues surrounding Project Completion.

1.3 PRE-CONSTRUCTION CONFERENCE

A. Schedule a pre-construction conference before starting construction, immediately after execution of the Agreement. Conference is to be held at the Project Site, or other agreed upon location, at a time convenient to both the Owner and Architect. Conduct the meeting to review responsibilities and personnel assignments. Submit agenda to Architect and Owner three (3) days prior to meeting date.

B. Attendees: Authorized representatives of the Owner, Architect, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress, including the following:
   1. Introduction of All Project Members.
   2. Distribution of Contract Documents.
   3. Procedures Outlined for Contract Compliance Issues.
   4. Tentative Construction Schedule; Making Notes of Critical Dates.

5. Critical Work Sequencing.
6. Pre-Installation Conferences.
7. Work Hours.
8. Use of the Premises.
9. Deliveries.
10. Security Procedures.
11. Parking and Site Access Issues.
12. Office, Work, and Storage Areas.
13. Housekeeping & Cleaning of Construction Areas.
14. Safety Procedures.
15. First Aid.
16. Procedures for Creating Monthly Cash Flow/Schedule.
17. Procedures for processing Draft Application for Payment Periodic Submittals Certification Statement.
18. Procedures for processing Applications for Payment.
19. Procedures for RFI's, SI's, RFP's, COP's, CCD's, CO's, etc…
20. Procedures for Keeping Logs on RFI's, SI's, RFP's, COP's, CCD's, CO's, etc…
21. Project Coordination Procedures & Drawings.
22. Project Meetings & Meeting Minutes.
23. Unit Prices.
24. Procedures for Submittals.
25. Quality Control, Inspections, and Testing.
26. Temporary Facilities.
27. Preparation of Project Closeout Documents.

D. The Contractor shall record and promptly distribute minutes of this meeting to all project members (in attendance or not), including the Architect and Owner, and as additionally directed by the Architect.
   1. Meeting Minutes shall be in a standard type-written format to remain consistent for every project meeting and include, but not limited to, the following items:
      a. Detailed notes from all discussions of project business items in chronological order.
      b. Updated Project Contractor, Subcontractor, Vendor List.
      c. Updated Construction Schedule.

1.4 PRE-INSTALLATION CONFERENCES

A. Conduct a pre-installation conference at the Project Site before each construction activity that requires coordination with other constructions.

B. Attendees: The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the Architect of scheduled meeting dates.
   1. Review the progress of other construction activities and preparations for the activity under consideration at each pre-installation conference, including requirements for the following:
      a. Contract Documents.
      b. Options.
      c. Related Change Orders.

d. Purchases.
e. Deliveries.
f. Shop Drawings, Product Data, and quality-control samples.
g. Review of mockups or finish samples.
h. Possible conflicts.
i. Compatibility problems.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities.
q. Existing Occupancies.
r. Space and access limitations.
s. Governing regulations.
t. Safety.
u. Inspecting and testing requirements.
v. Required performance results.
w. Recording requirements.
x. Protection.

2. The Contractor shall record significant discussions and agreements and disagreements of each conference, and the approved schedule. The Contractor shall promptly distribute the record of the meeting to everyone concerned, including the Owner and the Architect.
3. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

1.5 PROGRESS MEETINGS

A. Conduct progress meetings at the Project Site weekly. Notify the Owner and the Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request. General Contractor to record minutes of all meetings.

B. Attendees: In addition to representatives of the Owner and the Architect, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of each entity present, including the following:
   a. Interface Requirements.
   b. Time & Project Progress.
   c. Work Hours.
   d. Updated Weekly Look-Ahead Schedule.
   e. Critical Work Sequencing.
   f. Off-Site Fabrication Problems.
   g. Updated Pre-Installation Conference Schedule.
   h. Deliveries.
   i. Use of the Premises.
   j. Security Procedures.
   k. Parking Issues & Snow Removal.
   l. Office, Work, and Storage Areas.
   m. Housekeeping & Cleaning of Construction Areas.
   n. Safety Procedures.
   o. First Aid.
   p. Draft Application for Payment Periodic Submittals Certification Statement (At Appropriately Timed Meeting Each Month).
   q. Updated Submittal, RFI, SI, RFP, COP, CCD, and CO Logs.
   r. New Submittals, RFI's, SI's, RFP's, COP's, CCD's, CO's, etc…
   s. Any Project Coordination Issues or Drawings.
   t. Quality Control, Inspections, and Testing.
   u. Temporary Facilities.
   v. Preparation of Project Closeout Documents.
3. The Contractor shall record and promptly distribute minutes of this meeting to all project members (in attendance or not), including the Architect and Owner, and as additionally directed by the Architect.
   a. Meeting Minutes shall be in a standard type-written format to remain consistent for every project meeting and include, but not limited to, the following items:
      1) Detailed notes from all discussions of project business items in chronological order.
      2) Updated Project Contractor, Subcontractor, Vendor List.
      3) Updated Construction Schedule.
      4) Updated Weekly Look-Ahead Schedule.
      5) Updated Submittal, RFI, SI, RFP, COP, CCD, and CO Logs.

1.6 COORDINATION MEETINGS

A. Conduct coordination meetings with all trades convenient for all parties involved. In addition, conduct coordination meetings when requested by the Architect or Clerk of Works.

1.7 TIME OF PROGRESS AND COORDINATION MEETINGS

A. Conduct both meetings weekly on a day agreeable to all parties, at a designated location at the site, or other agreed upon location.

1.7 PROJECT CLOSEOUT CONFERENCE

A. The Project Close-Out Conference shall be conducted at a time convenient for all parties involved prior to Substantial Completion. Refer to Section 01700 – Project Closeout for additional information for requirements.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made a part of this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for handling requests for substitutions made after award of the Contract.

B. References Standards and Definitions: Refer to Section 014200 "Reference" for applicability of industry standards to products specified.

1. Requirements for submitting the Contractor's Construction Schedule and the Submittal Schedule are included under Section 013300 “Submittal Procedures”.
2. Procedural requirements governing the Contractor's selection of products and product options are included under Section 016000 “Product Requirements”.

1.3 DEFINITIONS

A. Definitions used in this Article do not change or modify the meaning of other terms used in the Contract Documents.

B. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to requests for substitutions. The following are not considered to be requests for substitutions:

1. Specified options of products and construction methods included in the Contract Documents.
2. The Contractor's determination of, and compliance with, governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

A. Substitution Request Submittal: Requests for substitution will be considered if received within two (2) days after commencement of the Work. Requests received more than two (2) days after commencement of the Work may be considered or rejected at the discretion of the Architect.

1. Submit three (3) copies of each request for substitution for consideration. Submit requests in the form and according to procedures required for Change-Order Proposals.
2. Identify the product or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers.
3. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:

a. Product Data, including Drawings and descriptions of products and fabrication and installation procedures.
b. Samples, where applicable or requested.
c. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
d. Cost information, including a proposal of the net change, if any in the Contract Sum.
e. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.

4. Architect's Action: Within five (5) days of receipt of a request for substitution the Architect will request additional information or documentation for evaluation necessary for the evaluation of the request. Within five (5) days of receipt of the request, or of receipt of additional information or documentation, whichever is later, the Architect will notify the Contractor of acceptance or rejection of the substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order when a change in the Contract Sum or Contract Time is required; or in the form of the Architect's Supplementary Instructions when no change to the Contract Sum or Time is required.

1.5 WORK CONDITIONS / SEQUENCE

A. If sub-contractors find that conditions are not appropriate for them to begin the work of their trade or if they are directed to perform their work out of sequence by the General Contractor or if the General Contractor directs sub-contractors to start and continue regardless of job conditions, the sub-contractor shall so notify the Architect in writing by certified mail immediately.

PART 2 – PRODUCTS

2.1 SUBSTITUTIONS

A. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples that relate to construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

B. Conditions: The Architect will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied, as determined by the Architect. If the following conditions are not satisfied, the Architect will return the requests without action except to record non-compliance with these requirements.
1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of the Contract Documents.
3. The request is timely, fully documented, and properly submitted.
4. The request is directly related to an "or-equal" clause or similar language in the Contract Documents.

5. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
6. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
7. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
8. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made a part of this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Division 1 Section 012900 “Payment Procedures” for administrative procedures governing applications for payment.
2. Division 1 Section 013300 “Submittal Procedures” for requirements for the Contractor’s Construction Schedule.
3. Division 1 Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after award of the Contract.

1.3 MINOR CHANGES IN THE WORK

A. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, will be issued by the Architect on the City's Form of Supplemental Instructions.

1.4 REQUEST FOR PROPOSAL

A. Owner initiated Request for Proposal: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.

1. Proposal requests issued by the Architect are for information only. Do not consider them an instruction either to stop work in progress, or to execute the proposed change.

1.5 PROPOSED CHANGE ORDER

A. Proposed Change Order: Using the form at the end of this section submit your proposal for the adjustment to the Contract Sum or Contract Time in response to a Request for Proposal or for Contractor initiated request for a change with Proposed Change Order.

1. Unless otherwise indicated in the Request For Proposal, within twenty (20) days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost necessary to execute the proposed change.

a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

b. Indicate delivery charges, equipment rental, and amounts of trade discounts.

c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time.

B. Contractor initiated request for change with Proposed Change Order: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.

1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.

a. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.

b. Indicate delivery charges, equipment rental, and amounts of trade discounts.

c. Comply with requirements in Section 01631 "Product Substitutions" if the proposed change in the Work requires the substitution of one product or system for a product or system specified.

1.6 ALLOWANCES

A. Allowance Adjustment: Base each Change Order Proposal Request for an allowance cost adjustment solely on the difference between the actual purchase amount and the allowance, multiplied by the final measurement of work-in-place, with reasonable allowances, where applicable, for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in the purchase amount only where indicated as part of the allowance.

2. When requested, prepare explanations and documentation to substantiate the margins claimed.

3. The Owner reserves the right to establish the actual quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit, within twenty (20) days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. Claims submitted later than twenty (20) days will be rejected.

1. The Change Order cost amount shall not include the Contractor's indirect expense except when it is clearly demonstrated that either the nature or scope of work required was changed from that which could have been foreseen from information in Contract Documents.

2. No change to the Contractor's indirect expense is permitted for selection of higher or lower priced materials or systems of the same scope and nature as originally indicated.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. A Construction Change Directive shall be issued for all work involving a change in contract cost or time. The Construction Change Directive instructs the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
   1. The Construction Change Directive will contain a complete description of the change in the Work and designate the method to be followed to determine change in the Contract Sum or Contract Time or is for a lump sum amount approved by the Architect.

B. Documentation: Maintain detailed records on a time, and material basis of work required by the Construction Change Directive, if so directed by the Architect.
   1. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.8 CHANGE ORDER PROCEDURES

A. Upon the Owner's approval of a Change Order Proposal Request, the Architect will issue a Change Order for signatures of the Owner and Contractor.

1.9 OVERHEAD AND PROFIT

A. Overhead and Profit will be as noted elsewhere in these specifications.
   1. Labor rates shall not exceed those shown in the contract specifications as set forth by the Department of Labor and Industries.

B. In reviewing Change Orders, the Architect will exercise his right to request a complete breakdown from the contractor showing exact costs for labor and material, as well as delivery slips and invoices from suppliers and other subcontractors.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 012900

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made part of this Section.

B. Related Sections: Sections which contain requirements that relate to this Section include, but are not limited to the following:

1. Section 013300 – Submittal Procedures

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Progress Schedule, Schedule of Values, and Contractor's Applications for Payment.

1. Coordinate the Schedule of Values and Applications for Payment with the Contractor's Construction Schedule, List of Subcontracts, and Submittal Schedule.

B. The Contractor's Construction Schedule and Submittal Schedule are included in Section 013300 "Submittals".

1.3 PROGRESS SCHEDULE

A. Prepare the Progress Schedule in accordance with Article 8, Paragraphs 8.2.3 and 8.2.4 of the General Conditions for approval by the Architect.

1. The Progress Schedule shall conform to the requirements in Section 013300, paragraph 1.4, Contractor’s Progress Schedule, and the sample bound in the aforementioned paragraph.

1.4 SCHEDULE OF VALUES

A. Coordinate preparation of the Schedule of Values with preparation of the Progress Schedule.

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

a. Contractor's Progress Schedule.
b. Application for Payment forms.
c. List of products.
d. Schedule of allowances, if any.
e. Schedule of alternates, if any.
f. Schedule of unit prices, if any.
g. List of products.
h. List of principal suppliers and fabricators.
i. Schedule of submittals.

2. Submit the Schedule of Values to the Architect at the earliest possible date, but no later than seven (7) days before the date scheduled for submittal of the initial Application for Payment.

B. Format and Content: Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values. Provide at least one (1) line item for each Specification Section. Coordinate with the Architect for exact breakdown of major categories of work including, but not limited to major equipment and project closeout submittals.

1. Include the following Project identification on the Schedule of Values:
   a. Project name and location.
   b. Name of the Architect.
   c. Project number.
   d. Contractor's name and address.
   e. Date of submittal.
2. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
   a. Generic name.
   b. Related Specification Section.
   c. Description of Work.
   d. Name of subcontractor.
   e. Name of manufacturer or fabricator.
   f. Name of supplier.
   g. Change Orders (numbers) that have affected value.
   h. Dollar value to nearest dollar.
   i. Percentage of Contract Sum to the nearest percent, adjusted to total 100 percent.
3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Breakdown shall be done by sequence. Coordinate with the Project Manual Table of Contents. Break principal subcontract amounts down into several line items, including but not limited to major equipment and project closeout submittals.
4. Do not round amount off to the nearest whole dollar; carry all amounts out to the two (2) decimal places and the totals shall equal the Contract Sum.
5. For each part of the Work where an Application for Payment may include materials or equipment, purchased, or fabricated and stored, but not yet installed, provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
6. Margins of Cost: Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete, including its total cost and proportionate share of general overhead and profit margin for each item.
   a. Temporary facilities, project closeout submittals, and other major cost items that are not direct cost of actual work-in-place shall be shown as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.

7. Schedule Updating: Update and resubmit the Schedule of Values prior to the next Application for Payment when Change Orders or Construction Change Directives result in a change to the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Draft Application Preparation: Submit three (3) **draft** copies of the (current) Application for Payment at the weekly project meeting for Architect's review seven (7) days in advance of the "Payment Application Time" as indicated in the Agreement.
   1. Draft Application for Payment transmittal shall include a fully executed Draft Cover Sheet or **Periodic Submittal Certification Statement** on Contractor letterhead (bound at the end of this section hereafter) certifying that the following Periodic Submittals are current for the appropriate period:
      a. Originals of All Waivers of Mechanics Lien & Corresponding Logs Covering Status of All Waivers
      b. Certified payrolls
      c. Contract Compliance Submittals
      d. Insurance and transfer title certificates for any material stored off site
      e. Updated as-built drawings of record reflecting Work for the current Application period

B. Each Application for Payment shall be consistent with previous applications and payments as certified by the Architect and paid for by the Owner.
   1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

C. Payment Application Times: Each progress payment date is as indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

D. Payment Application Cover Sheet Form: Complete the enclosed **Application and Certification for Payment Cover Sheet** on Contractor letterhead (bound at the end of this Section hereafter) and transmit with each Payment Application Form submittal.

E. Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G 703 as the form for Application for Payment. **No exceptions will be made.**

F. Application Preparation: Complete every entry on the form, including notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Architect will return incomplete applications without action.
   1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
   2. Include only amounts of approved and fully executed Change Orders. Obtain approval from the Architect prior to inclusion into the Application.
   3. Each Application for Payment **must** be accompanied by an updated Progress Schedule. The format to which is subject to the Architect’s approval.

G. Payment for materials and/or equipment stored off site shall be considered upon the Owner's approved submission by the Contractor bill(s) of sale or such other documentation or procedures satisfactory to the Owner to establish the Owner's clear and legal title to such materials and/or equipment or otherwise provided to protect the Owner's interest. This shall include applicable insurance and transportation to the project site for those materials and/or equipment suitably stored off site under consideration for payment.

1. Any Contractor making an application for payment pursuant to Section 00200 – General Conditions, paragraph 9.3.2, shall provide the following written documentation to the Architect through the General Contractor as delineated below and as otherwise maybe reasonably requested by the Owner:
    a. Bill of Material, Purchase Order or Invoice Number.
    b. Product Description Listing.
    c. Serial Numbers (If Applicable)
    d. Materials and/or Equipment (wares) shall be segregated from all other stock or equipment and clearly labeled and/or marked as City of Worcester Property.
    e. Wares shall be available for inspection at all times and in any event within twenty-four (24) hours after receiving prior notice from the Owner/Architect.
    f. Provide written directions from the project site to the location of the stored wares.
    g. Name of contact person at the storage site and applicable telephone numbers.
    h. Method and mode of transportation from off site storage location to the job site.

H. Retainage: In accordance with the Supplemental General Conditions, the Awarding Authority (Owner) shall deduct a retainage not exceeding five (5) percent of the approved amount of the periodic payment. The aforesaid five (5) percent retainage deduction by the Owner is the only retainage authorized hereunder. The contractor shall not deduct any amounts from payments received on behalf of subcontractors, except those deductions specifically authorized by M.G.L. Chapter 30, Section 39(1)(a).

1. Upon the initial and any subsequent Application for Payment; requesting or reflecting a "Release of Retainage" provide a Summary cover sheet indicating the derivation arithmetically, by each line item, of the total released to date and the of the current total retainage sum.

I. Transmittal: Upon receipt of the required periodic submittals enumerated above and upon approval of the "Draft Application", submit six (6) fully executed and notarized original copies with Cover Sheet of the current Application for Payment to the Architect by means ensuring receipt within twenty-four (24) hours. One (1) copy shall be complete, including waivers of lien and similar attachments.

1. Transmit each copy with a transmittal form listing attachments, and recording appropriate information related to the application in a manner acceptable to the Architect.
2. With each requisition, after the first requisition, submit one (1) copy of up-dated as-built drawings for all underground and concealed work, showing locations, depths, or elevations.

J. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics lien from every entity who may lawfully be entitled to file a mechanics lien arising out of the Contract, and related to the Work covered by the payment.

1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the previously paid application.
    a. Submit final Application for Payment with, or preceded by, final waivers from every entity involved with performance of Work covered by the application that could lawfully be entitled to a lien.
5. Waiver Forms: Submit waivers of lien on forms, and executed in a manner, acceptable to Owner.

K. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
1. List of subcontractors; at all tiers.
2. List of principal suppliers and fabricators.
3. Approved Schedule of Values.
4. Approved Contractor’s Progress Schedule see Section 01300, Paragraph 1.4.
5. Contractor's Construction Schedule (preliminary if not final).
6. Schedule of principal products.
7. Submittal Schedule (preliminary, if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.
11. Copies of authorizations, permits and licenses from governing authorities for performance of the Work.
12. Initial progress report.
13. Report of pre-construction meeting.
14. Schedule of Pre-installation meetings.
15. Certificates of insurance and insurance policies.
16. Performance and payment bonds.
17. Data needed to acquire Owner's insurance.
18. Initial settlement survey and damage report, if required.
19. List of Contractor's personnel names and titles assigned on the project and emergency telephone numbers.

L. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
2. Administrative actions and Submittals that shall precede or coincide with this application include:
    a. Occupancy permits and similar approvals.
    b. Warranties (guarantees) and maintenance agreements.
    c. Test/adjust/balance records.

d. Maintenance instructions.
e. Meter readings.
f. Start-up performance reports.
g. Changeover information related to Owner's occupancy, use, operation and maintenance.
h. Final cleaning.
i. Application for reduction of retainage, and consent of surety
j. Advice on shifting insurance coverage.
k. Final progress photographs.
l. List of incomplete work, recognized as exceptions to Architect's Certificate of Substantial Completion.

M. Final Payment Application: Administrative actions and submittals that must precede or coincide with submittal of the final payment Application for Payment include the following:
1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion
3. Assurance that unsettled claims will be settled.
4. Assurance that incomplete Work and Work not accepted will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Certified property survey.
7. Proof that taxes, fees and similar obligations have been paid.
8. Removal of temporary facilities and services.
9. Removal of surplus materials, rubbish and similar elements.
10. Change of door locks to Owner's access.
11. Order of Conditions Certificate of Compliance, if applicable.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

CONTRACTOR LETTER HEAD

APPLICATION AND CERTIFICATION FOR PAYMENT COVER SHEET

PROJECT:_____ APPLICATION NO: _____

For
Period
Ending: _____ AMOUNT CERTIFIED: $_____

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief, the Work covered by this Application for Payment has been completed in accordance with the Contract Documents; and the current Payment shown herein is now due.

The Contractor further certifies that the entire amount of all previous Payments received for labor performed and materials furnished have been promptly paid to all Subcontractors whose work was certified for payment on previous applications, less, where applicable, only an amount specified in any court proceeding barring such payment and/or an amount claimed due from the Subcontractor by the Contractor as expressly authorized by M.G. L. Chapter 30, Section 39F (1) (a). No other amounts have been deducted or retained from such payments by the contractor.

Contractor: _____ **STATE OF:** _____

Signed by: _____ **COUNTY OF:** _____

Date: _____ Subscribed and sworn to before me on this
_____ Day of _____ 20__.

Notary public: _____
My Commission Expires: _____

APPROVED FOR PAYMENT:

Signed:_____ Signed:_____
By: James Bedard, Facilities Director By: Robert Sherman., Architect

Date:_____ Date:_____

Signed:_____ Signed:_____
By: By:

Date:_____ Date:_____

CONTRACTOR LETTER HEAD

DRAFT APPLICATION FOR PAYMENT
PERIODIC SUBMITTAL CERTIFICATION STATEMENT

Project Name: Draft Application Date: _____

Draft Application No._____ (Requisition No.)

For Period:
Starting _____
Through Period
Ending _____

_____(Name of Contractor) _____ ,
certifies that the "Draft Application for Payment" as herein submitted with all of the following Periodic Submittals fully and completely executed and current for the appropriate time period(s) as required.
FURNISH THE FOLLOWING PERIODIC SUBMITTALS AND PROVIDE ALL REQUIRED INFORMATION FOR THE APPROPRIATE TIME PERIOD(S) AS REQUESTED. PLEASE SUBMIT ON **SEPARATE** SHEETS:

I. **Original Waivers of Mechanic Lien:** List every entity who may be lawfully entitled to file a lien resulting out of this Contract, including but not limited to; contractors/subcontractors, at all tiers, vendors, and suppliers. Submit current originals of all Waivers covering all WORK completed through the period ending thirty (30) days prior to this periods "Application" date and as further required in I above.

II. **Certified Payrolls:** All payroll reports have been submitted as required by the Contract Compliance Office.

III. **Contract Compliance Reports:** All contract compliance reports have been submitted as required by the Contract Compliance Office.

IV. **Insurance & Title Transfer Certificates** for material stored off site, if applicable.

V. **Updated As-Built Drawings:** Record drawings have been submitted reflecting the work completed up to the time of Application.

This Draft Application for Payment Certification Statement and corresponding Periodic Submittals (attached) shall be reviewed by the Awarding Authority for completeness. Any deficiency, discrepancies or missing items shall cause this Draft Application for Payment to be returned to the Contractor with no action taken.
I, _____ hereby certify, that the Periodic
(Name of contractor)

Submittals indicated herein have been reviewed by the undersigned and are complete and current as required under provisions of this Contract.

_____
_____
(Name of Authorized Person) (Date)

_____
(Title)

END OF SECTION

SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made a part of this Section.

1.2 SUMMARY

A. This Section specifies administrative and supervisory requirements necessary for project coordination including, but not limited to the following:
   1. Coordination and cutting, drilling, and patching.
   2. General installation provisions.
   3. Administrative and supervisory personnel.
   4. Cleaning and protection.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Project meetings, coordination meetings, and pre-installation conferences are included in Section “Project Meetings.”
   2. Requirements for preparing and submitting the Contractor's Construction Schedule are included in Section “Submittals.”

1.3 COORDINATION

A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections of the specifications that depend on each other for proper installation, connection, and operation.
   1. Where installation of one part of the Work depends on installation of other components, either before or after its own installation, schedule construction operations in the sequence required to obtain the best results.
   2. Where availability of space is limited coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
   3. Make provisions to accommodate items scheduled for later installation.
   4. The General Contractor shall as part of his work provide for all cutting, patching, and drilling, not specified to be the work of others.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
   1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Progress meetings.
   5. Project closeout activities.
   6. Coordinate with temp chiller supplier to coincide with General Contractor's crane equipment being onsite and all Work relating to offloading from chiller delivery truck.

D. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare coordination Drawings where careful coordination is needed for installation of products and materials fabricated by separate entities. Prepare coordination drawings where limited space availability necessitates maximum utilization of space for efficient installation of different components.
   1. Show the relationship of components shown on separate Shop Drawings.
   2. Indicate required installation sequences.
   3. Comply with requirements contained in Section 01300 – Submittals.
   4. Format to be as directed by the Architect.
   5. Provide site staging and lift plan.

B. Staff Names: Within fifteen (15) days of commencement of construction operations, submit a list of the Contractor's principal staff assignments, including the superintendent and other personnel in attendance at the Project Site. Identify individuals and their duties and responsibilities. List their addresses and telephone numbers. Provide twenty-four (24) hour Emergency telephone numbers listed separately.
   1. Post copies of the list in the Project meeting room, the temporary field office, and each temporary telephone.
   2. The Contractor shall provide a copy of the list, and updates as its changes, to the Worcester Police Department and other City Departments as directed by the Architect.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.

B. Manufacturer's Instructions: Comply with manufacturer's written instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than the requirements contained in Contract Documents.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.

E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

F. Re-check measurements and dimensions, before starting each installation.

G. Install each component during weather conditions that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

I. Mounting Heights: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the application indicated. Refer questionable mounting height decision to the Architect for final decision.

3.2 CLEANING AND PROTECTION

A. During handling and installation clean and protect construction in progress and adjoining materials in place. Apply protective covering where required and as necessary to assure protection from damage or deterioration.

B. Clean and maintain all completed construction as frequently as necessary through the remainder of the construction period.

C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in-progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive vibration.
2. Excessive static or dynamic loading.
3. Excessive internal or external pressures.
4. Excessively high or low temperatures.
5. Thermal shock.
6. Excessively high or low humidity.
7. Air contamination or pollution.
8. Air borne debris/dust or construction particulates.
9. Water or ice.
10. Solvents.
11. Chemicals.
12. Light.
13. Puncture.
14. Abrasion.

15. Heavy traffic.
16. Soiling, staining, and corrosion.
17. Bacteria.
18. Rodent and insect infestation.
19. Combustion.
20. Electrical current.
21. High-speed operation.
22. Improper lubrication.
23. Unusual wear or other misuse.
24. Contact between incompatible materials.
25. Destructive testing.
26. Misalignment.
27. Excessive weathering.
28. Unprotected storage.
29. Improper shipping or handling.
30. Theft.
31. Vandalism.

END OF SECTION

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made part of this Section.
   1. The submittals enumerated below shall require review and/or approval by the Architect.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submittals required for performance of the Work, including:
   1. Contractor's Progress Schedule.
   2. Major delivery schedule.
   3. Existing utility tie-in's schedule.
   4. Submittal schedule.
   5. Pre-Installation Conference Schedule (By Specification Section).
   6. Daily construction reports.
   7. Shop drawings.
   8. Product data.
   9. Samples.
   10. Coordination Drawings.
   11. Quality assurance submittals.
   12. Submittal of three (3) sets of plans and specifications, complete with all addendums posted, to the City of Worcester Building Department to obtain building permit.

B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to, the following:
   1. Product Substitution.
   2. Periodic Submittals.
   3. Permits.
   4. Applications for Payment.
   5. Performance and payment bonds.
   6. Insurance Certificates.
   7. List of Project Contractors, Subcontractors, Vendors, etc.
   8. List of Personnel and Emergency Telephone Numbers.
   9. City Ordinance Program Forms.

C. The Schedule of Values submittal is included in Section 01027 "Applications for Payment".

D. "Project Closeout", Section 01700, specifies requirements for submittal of Project Record Documents and warranties at project closeout.

1.3 SUBMITTAL PROCEDURES/SHOP DRAWINGS

A. Submittal procedures shall be electronic for all submittals for approval and distribution unless otherwise noted. Provide to the owner one copy of all approved submittals in an organized manner with a submittal log. All color samples must be distributed as hard copies, and also electronically filed in order to track. Electronic files shall be clean, clear and readable. Plan files to be PDF and/or AutoCAD and be to scale as appropriate. Contractor to transmit and update each submittal and process electronically, maintain a log that is distributed and updated weekly. All e-mails to clearly identify the submittal number and shall include the log, Or the contactor to maintain a web-based system used for submittals, and the construction process.

B. Distribution: Distribution of submittals shall be distributed as follows unless otherwise noted:
   1. Architect.
   2. Clerk of Works.
   3. Owner – electronic and paper copy.
   4. A minimum of Three (3) copies for the Contractor as necessary for distribution to subcontractors, suppliers, installers, manufacturers, fabricators, and any other applicable parties.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

D. Processing: All Contractors are directed to the timeliness and critical importance of expediting the submittal process. Any lead times, which may impact sequencing, should be prioritized to meet the project schedule. Architect must be notified if any delays arise that will impact lead times.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.
   3. To avoid the need to delay installation as a result of the time required to process submittals and to allow sufficient time for submittal review, all contractors' submittals shall be submitted for processing and have received final Architect's approval within 45 days from the date of Contract.
      a. Allow ample time for initial review to achieve efficient construction sequencing. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals.
      b. If an intermediate submittal is necessary, process the same as the initial submittal.
      c. Allow ample time for reprocessing each submittal to achieve efficient construction sequencing.
      d. No extension of Contract Time will be authorized because of the contractor's failure to transmit submittals to the Architect for processing sufficiently in advance of the scheduled Work.

E. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4 by 5 inches on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken.
    a. Project name.
    b. Date.
    c. Name and address of the Architect.
    d. Name and address of the Contractor.
    e. Name and address of the subcontractor.
    f. Name and address of the supplier.
    g. Name of the manufacturer.
    h. Number and title of appropriate Specification Section.
    i. Drawing number and detail references, as appropriate.

F. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Architect using a transmittal form. The Architect will not accept submittals received from sources other than the Contractor.

G. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.4 CONTRACTOR'S PROGRESS SCHEDULE

A. Bar (Gantt) Chart Schedule: Meeting the requirements of Section 00200 Paragraphs 4.10, 4.10.1, 8.2.3 through 8.2.9. Prepare a fully developed, horizontal bar type of chart titled: “Progress Schedule”. A sample is attached at the end of this section, some requirements specified here are not shown in the sample.

B. Time, the horizontal (x) axis in this schedule shall show the start of on-site work through the Date of Substantial Completion, show the time for completion of punch list items, and show the time for general warranty and completion of commissioning.

C. Provide a separate time bar for each line in the approved “Schedule of Values” with the incremental value of work in place for each month. Work Completed (in place) must be 99% of contract value to achieve Substantial Completion. Provide a continuous vertical line to identify the first working day of each month.

D. At the bottom of the progress schedule provide:
1. A first line showing the total value of the work planned to be completed (in place) for each month,
2. A second line showing the cumulative total value of the work planned to be completed (in place) to date,
3. A third line showing the actual total value of the work certified as completed (in place) on the Application and Certificate for Payment for the month, and
4. A fourth line showing the actual total cumulative value of the work certified as completed (in place) on the Application and Certificate for payment to date.
5. Refer to Division 1 Section 01027 "Applications for Payment" for cost reporting and payment procedures.

E. Distribution: Following approval of the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to provide actual work in place and conform to schedule.

F. Revisions: Revisions to values and or time shown in the Progress Schedule may only be made to reflect a Change Order and in accordance with Section 00200 Paragraph 8.2.7. When revisions are made, distribute to the same parties and post at the jobsite. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

G. Progress Schedule Updating: Revise the schedule after each meeting, where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

Progress Schedule (as required by Article 8, Paragraphs 8.2.3 & 8.2.4 of the General Conditions)

(Project Name)	(Architect)	(Date)
(City of Worcester Dept. or Facility)	(Construction Manager)	(Revision Date)
(Project Address)	(Contractor)	(Revised Through)

(Approved by Architect)

Section Number	Section or Filed Sub-bid Section	Mar-98 1	Apr-98 2	May-98 3	Jun-98 4	Jul-98 5	Oct-98 6	Nov-98 7	Dec-98 8	Totals
01000	General Requirements	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$4,000	$32,000
02000	Sitework	$10,000	$10,000						$10,000	$30,000
03000	Concrete		$4,000	$12,000			$8,000			$24,000
04000	Masonry			$8,000	$10,000	$12,000				$30,000
05000	Metals			$20,000						$20,000
05500	Metal Fabrications							$7,000		$7,000
06000	Wood & Plastics								$4,000	$4,000
07100	Waterproofing & Caulking				$3,000					$3,000
07600	Roofing & Flashing					$12,000				$12,000
08000	Doors & Windows						$4,000			$4,000
08520	Alum. Windows							$8,000		$8,000
08800	Glass & Glazing								$1,000	$1,000
09250	Gypsum Drywall						$6,000	$5,000		$11,000
09310	Ceramic Tile							$2,000		$2,000
09511	Accoustical Ceilings							$1,000	$1,000	$2,000
09650	Resilient Flooring								$3,000	$3,000
09900	Painting								$2,000	$2,000
10000	Specialties								$14,000	$14,000
14204	Hydraulic Elevators						$8,000	$8,000	$8,000	$24,000
15400	Plumbing			$1,000	$2,000			$3,000	$5,000	$11,000
15600	HVAC					$4,000	$5,000		$4,000	$13,000
16000	Electrical			$1,000	$3,000			$4,000	$4,000	$12,000
	Total Planned to be Completed This Month	$14,000	$18,000	$46,000	$22,000	$32,000	$35,000	$42,000	$60,000	
	Total planned to be Completed To Date	$14,000	$32,000	$78,000	$100,000	$132,000	$167,000	$209,000	$269,000	$269,000
	Actual Total Completed This Month	$11,000	$22,000	$38,000						
	Actual Total Completed To Date	$11,000	$33,000	$71,000	$71,000	$71,000	$71,000	$71,000	$71,000	$470,000

1.5 SUBMITTAL SCHEDULE

A. After development and acceptance of the Contractor's Progress Schedule, prepare a complete Submittal Schedule and promptly submit the schedule to the Architect.

B. Distribution: Following response to the initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates.

C. Submittal Schedule Updating: Revise the Submittal Schedule after each meeting or activity where revisions have been recognized or made. Issue the updated project schedule concurrently with each Application for Payment.

1.6 DAILY CONSTRUCTION REPORTS

A. Prepare a daily construction report recording the following information concerning events at the site, and submit copies to the Architect and Clerk of Works at weekly intervals:

1. List of subcontractors at the site.
2. Count of personnel at the site.
3. Accidents and unusual events.
4. Meetings and significant decisions.
5. Stoppages, delays, shortages, and losses.
6. Emergency procedures.
7. Services connected, disconnected.
8. Equipment or system tests and startups.
9. General daily work tasks and progress.

1.7 SHOP DRAWINGS

A. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples that relate to construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

B. Submit newly prepared information drawn accurately to scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not a Shop Drawing.

C. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates, and similar Drawings. Include the following information:

1. Dimensions.
2. Identification of products and materials included by sheet and detail number.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.

1.8 PRODUCT DATA

A. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples that relate to construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

B. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information, such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams, and performance curves.

1. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings".
2. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products that are not required, mark copies to indicate the applicable information. Include the following information:
   a. Manufacturer's printed recommendations.
   b. Compliance with trade association standards.
   c. Compliance with recognized testing agency standards.
   d. Application of testing agency labels and seals.
   e. Notation of dimensions verified by field measurement.
   f. Notation of coordination requirements.

C. Do not submit Product Data until compliance with the requirements of the Contract Documents has been confirmed.

D. Unless non-compliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

E. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.
1. Do not proceed with installation until a copy of Product Data is in the Installer's possession.
2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 SAMPLES

A. The Contractor's submittal and the Architect's acceptance of Shop Drawings, Product Data, or Samples that relate to construction activities not complying with the Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

B. Mount or display samples in the manner to facilitate review of qualities indicated. Prepare samples to match the Architect's sample. Include the following:
1. Specification Section number and reference.
2. Generic description of the sample.
3. Sample source.
4. Product name or name of the manufacturer.
5. Compliance with recognized standards.
6. Availability and delivery time.

C. Submit samples for review of size, kind, color, pattern, and texture. Submit samples for a final check of these characteristics with other elements and a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

D. Preliminary Submittals: Submit a full set of choices where samples are submitted for selection of color, pattern, texture, or similar characteristics from a range of standard choices.
1. Preliminary submittals will be reviewed and returned with the Architect's mark, indicating selection and other action.

E. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit three (3) sets. One (1) set will be returned marked with the action taken.

1. Maintain sets of samples, as returned, at the Project Site, for quality comparisons throughout the course of construction.

F. Unless non-compliance with Contract Document provisions is observed, the submittal may serve as the final submittal.

1. Sample sets may be used to obtain final acceptance of the construction associated with each set.

1.10 QUALITY ASSURANCE SUBMITTALS

A. Submit quality-control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality-control submittals as required under other Sections of the Specifications.

B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements; submit a notarized certification from the manufacturer certifying compliance with specified requirements.

1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

1.11 ARCHITECT'S ACTION

A. Except for submittals of record or information, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return as noted in Paragraph 1.3A.

B. Compliance with specified characteristics is the Contractor's responsibility.

C. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The Architect will mark the stamp appropriately to indicate the action taken:

D. Final Unrestricted Release: When submittals are marked "Approved", the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend on that compliance.

1. Final-But-Restricted Release: When submittals are marked "Approved as Noted", that Work covered by the submittal may proceed provided it complies with markings or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.

2. Returned for Resubmittal: When submittal is marked “Approved as Noted - Revise and Resubmit” or “Not Approved, Revise and Resubmit", do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the markings and resubmit without delay. Repeat if necessary to obtain different action mark.

E. The Contractor shall not use or permit to be used submittals marked “Approved as Noted - Revise and Resubmit” or "Not Approved, Revise and Resubmit" at the Project Site or elsewhere where Work is in progress.

F. Other Action: Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned marked "Action Not Required".

1.12 DRAWINGS TO BUILDING DEPARTMENT

A. The Contractor shall submit three (3) sets of fully addendum plans and specifications to the City of Worcester Building Department upon application for the building permit.

1. Submit drawings to architect prior to permit application for "wet stamping" of architect and engineers professional seal to the drawings. Allow up to three (3) days for this process.
2. Any reduction in addenda plan must be legible.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made a part of this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Quality-Control Services.

B. Quality-Control Services include inspections, tests, and related actions, including reports performed by Contractor, by independent agencies, and by governing authorities. They do not include contract enforcement activities performed by Architect.

C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.

D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified inspections, tests, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with Contract Document requirements.
3. Requirements for Contractor to provide quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 RESPONSIBILITIES

A. Contractor Responsibilities: The Contractor shall provide inspections, tests, and other similar Quality-Control Services specified in individual Specification Sections and as required by governing authorities. Costs for these services are included in the Contract Sum.

1. The Contractor shall employ and pay a qualified independent testing agency to perform specified Quality-Control Services.
2. Where the Owner has engaged an independent testing agency for testing and inspecting part of the Work, and the Contractor is also required to engage a testing entity for the same or related part or element of the Work, the Contractor shall not employ the entity engaged by the Owner, unless agreed to in writing by the Owner.
3. Re-testing: The Contractor is responsible for retesting where results of inspections, tests, or other quality-control services prove unsatisfactory and indicate noncompliance with Contract Document requirements, regardless of whether the original test was Contractor's responsibility.

a. The cost of re-testing construction, revised or replaced by the Contractor, is the Contractor's responsibility where required tests performed on original construction.

4. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests, and similar services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include, but are not limited to, the following:
   a. Provide access to the Work and furnish incidental labor, facilities, and equipment necessary to facilitate inspections and tests.
   b. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.
   c. Provide facilities for storage and curing of test samples.
   d. Provide security and protection of samples and test equipment at the Project Site.

B. Owner Responsibilities: The Owner will engage and pay for the services of an independent testing agency to perform inspections, tests or other Quality-Control Services specified to be performed by independent testing agencies and not specified as the responsibility of the Contractor and/or are provided for by another identified entity. Costs for these services are not included in the Contract Sum.
   1. The Owner shall employ and pay for the services of a qualified independent testing agency, testing laboratory or other qualified entity to perform Quality-Control Services, which are the Owner’s responsibility.

C. Duties of the Testing Agency: The independent agency engaged to perform inspections, sampling, and testing of materials and construction specified in individual Sections shall cooperate with the Architect and the Contractor in performance of the agency's duties. The testing agency shall provide qualified personnel to perform required inspections and tests.
   1. The agency shall notify the Architect and the Contractor promptly of irregularities or deficiencies observed in the Work during the performance of its services.
   2. The agency is not authorized to release, revoke, alter, or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.
   3. The agency shall not perform any duties of the Contractor.

D. Coordination: Coordinate the sequence of activities to accommodate required services with a minimum of delay. Coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.
   1. The Contractor is responsible for scheduling times for inspections, tests, taking samples, and similar activities.

1.4 SUBMITTALS

A. Unless the Contractor is responsible for this service, the independent testing agency shall submit a certified written report, in duplicate, of each inspection, test, or similar service to the Architect. If the Contractor is responsible for the service, submit a certified written report, in duplicate, of each inspection, test, or similar service through the Contractor.
   1. Submit additional copies of each written report directly to the governing authority, when the authority so directs.

2. Report Data: Written reports of each inspection, test, or similar service include, but are not limited to, the following:
   a. Date of issue.
   b. Project title and number.
   c. Name, address, and telephone number of testing agency.
   d. Dates and locations of samples and tests or inspections.
   e. Names of individuals making the inspection or test.
   f. Designation of the Work and test method.
   g. Identification of product and Specification Section.
   h. Complete inspection or test data.
   i. Test results and an interpretation of test results.
   j. Ambient conditions at the time of sample taking and testing.
   k. Comments or professional opinion on whether inspected or tested Work complies with Contract Document requirements.
   l. Name and signature of laboratory inspector.
   m. Recommendations on retesting.

1.5 QUALITY ASSURANCE

A. Qualifications for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, that are prequalified as complying with the American Council of Independent Laboratories' "Recommended Requirements for Independent Laboratory Qualification" and that specialize in the types of inspections and tests to be performed.
   1. Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State of Massachusetts.

1.6 WORK CONDITIONS / SEQUENCE

A. If sub-contractors find that conditions are not appropriate for them to begin the work of their trade or if they are directed to perform their work out of sequence by the General Contractor or if the General Contractor directs sub-contractors to start and continue regardless of job conditions, the sub-contractor shall so notify the Architect in writing by certified mail immediately.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample taking and similar services, repair damaged construction and restore substrates and finishes.

B. Protect construction exposed by or for quality-control service activities and protect repaired construction.

C. Repair and protection is Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

END OF SECTION

SECTION 014200

REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made part of this Section.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. Indicated: The term indicated refers to graphic representations, notes, or schedules on the Drawings, or other Paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as shown, noted, scheduled, and specified are used to help the reader locate the reference. There is no limitation on location.

C. Directed: Terms such as directed, requested, authorized, selected, approved, required, and permitted mean directed by the Architect, requested by the Architect, and similar phrases.

D. Approved: The term approved, when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.

E. Regulations: The term regulations include laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

F. Furnish: The term furnish means supply and delivery to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations to the location within the project where the product will finally be installed.

G. Install: The term install describes operations at the Project site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. Provide: The term provide means to furnish and install, complete and ready for the intended use.

I. Installer: An Installer is the Contractor, or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged in performing.

1. The term experienced, when used with the term Installer, means having a minimum of five (5) previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.

2. Trades: Using terms such as carpentry is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as carpenter. It also does not imply that the requirements specified apply exclusively to tradespersons of the corresponding generic name.

3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no choice or option. However, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

    a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

J. Project site is the space available to the Contractor for performing construction activities either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is located.

K. Testing Agencies: A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret the results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16 Division format and MASTERFORMAT numbering system.

B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words that are implied, but not stated, shall be interpolated, as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.

    a. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Except where 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 the standards in effect as of the date of the Contract Documents.

C. Conflicting Requirements: Where compliance with two (2) or more standards is specified and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different but apparently equal and other uncertainties to the Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

D. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the Text provision. Refer to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but not ensured, to be accurate and up to date as of the date of Contract Documents.

AA	**Aluminum Association** **900 19th St., NW, Suite 300** **Washington, DC 20006**	**(202) 862-5100**
AABC	**Associated Air Balance Council** **1518 K St., NW** **Washington, DC 20005**	**(202) 737-0202**
AAMA	**American Architectural Manufacturers Association** **1540 E. Dundee Road, Suite 310** **Palatine, IL 60067**	**(708) 202-1350**

AASHTO	**American Association of State Highway and Transportation Officials** **444 North Capitol St., Suite 225** **Washington, DC 20001**	**(202) 624-5800**
AATCC	**American Association of Textile Chemists and Colorists** **P.O. Box 12215** **Research Triangle Park, NC**	**(919) 549-8141**
ACI	**American Concrete Institute** **P.O. Box 19150** **Detroit, MI 48219**	**(313) 532-2600**
ACIL	**American Council of Independent Laboratories** **1629 K St., NW** **Washington, DC 20006**	**(202) 887-5872**
ACPA	**American Concrete Pipe Association** **8300 Boone Blvd., Suite 400** **Vienna, VA 22182**	**(703) 821-1990**
ADC	**Air Diffusion Council** **One Illinois Center, Suite 200** **111 East Wacker Drive** **Chicago, IL 60601-4298**	**(312) 616-0800**
AFBMA	**Anti-Friction Bearing Manufacturers Association** **1101 Connecticut Ave., NW, Suite 700** **Washington, DC 20036**	**(202) 429-5155**
AGA	**American Gas Association** **1515 Wilson Blvd.** **Arlington, VA 22209**	**(703) 841-8400**
AHA	**American Hardboard Association** **520 North Hicks Road** **Palatine, IL 60067**	**(708) 934-8800**
AHAM	**Association of Home Appliance Manufacturers** **20 North Wacker Drive** **Chicago, IL 60606**	**(312) 984-5800**
AI	**Asphalt Institute** **Research Park Drive** **P.O. Box 14052** **Lexington, KY 40512-4052**	**(606) 288-4960**
AIA	**American Institute of Architects** **1735 New York Ave., NW** **Washington, DC 20006**	**(202) 626-7300**

A.I.A.	**American Insurance Association** **1130 Connecticut Ave., NW, Suite 1000** **Washington, DC 20036**	**(202) 828-7100**
AIHA	**American Industrial Hygiene Association** **P.O. Box 8390** **345 White Pond Drive** **Akron, OH 44320**	**(216) 873-2442**
AISC	**American Institute of Steel Construction** **One East Wacker Drive, Suite 3100** **Chicago, IL 60601-2001**	**(312) 670-2400**
AITC	**American Institute of Timber Construction** **11818 SE Mill Plain Blvd., Suite 415** **Vancouver, WA 98684**	**(206) 254-9132**
ALI	**Associated Laboratories, Inc.** **500 South Vermont Street** **Palatine, IL 60067**	**(708) 358-7400**
ALSC	**American Lumber Standards Committee** **P.O. Box 210** **Germantown, MD 20875**	**(301) 972-1700**
AMCA	**Air Movement and Control Association** **30 W. University Drive** **Arlington Heights, IL 60004-1893**	**(708) 394-0150**
ANSI	**American National Standards Institute** **11 West 42nd Street, 13th Floor** **New York, NY 10036**	**(212) 642-4900**
AOAC	**Association of Official Analytical Chemists** **2200 Wilson Blvd., Suite 400** **Arlington, VA 22201-3301**	**(703) 522-3032**
AOSA	**Association of Official Seed Analysts** **c/o Larry J. Prentice** **268 Plant Science 1ANR-UNL, Box 19281** **Lincoln, NE 68583-0911**	**(402) 472-8649**
APA	**American Plywood Association** **P.O. Box 11700** **Tacoma, WA 98411**	**(206) 565-6600**
API	**American Petroleum Institute** **1220 L St., NW** **Washington, DC 20005**	**(202) 682-8000**
ARI	**Air Conditioning and Refrigeration Institute** **1501 Wilson Blvd., 6th Floor** **Arlington, VA 22209**	**(703) 524-8800**

ARMA	**Asphalt Roofing Manufacturers Association** **6288 Montrose Rd.** **Rockville, MD 20852**	**(301) 231-9050**
ASA	**Acoustical Society of America** **500 Sunnyside Blvd.** **Woodbury, NY 11797**	**(516) 349-7800**
ASC	**Adhesive and Sealant Council** **1627 K Street, NW, Suite 1000** **Washington, DC 20006-1707**	**(202) 452-1500**
ASHRAE	**American Society of Heating, Refrigerating and Air-Conditioning Engineers** **1791 Tullie Circle, NE** **Atlanta, GA 30329**	**(404) 636-8400**
ASME	**American Society of Mechanical Engineers** **345 East 47th St.** **New York, NY 10017**	**(212) 705-7722**
ASPE	**American Society of Plumbing Engineers** **3617 Thousand Oaks Blvd., Suite 210** **Westlake, CA 91362**	**(805) 495-7120**
ASSE	**American Society of Sanitary Engineering** **P.O. Box 40362** **Bay Village, OH 44140**	**(216) 835-3040**
ASTM	**American Society for Testing and Materials** **1916 Race St.** **Philadelphia, PA 19103-1187**	**(215) 977-9679**
ATIS	**Alliance for Telecommunications Industry Solutions** **1200 G Street, NW, Suite 500** **Washington, DC 20005**	**(202) 628-6380**
AWCMA	**American Window Covering Manufacturers Association** **355 Lexington Avenue** **New York, NY 10017**	**(212) 661-4261**
AWI	**Architectural Woodwork Institute** **P.O. Box 1550** **13924 Braddock Rd., Suite 100** **Centreville, VA 22020**	**(703) 222-1100**
AWPA	**American Wood Preservers' Association** **4128-1/2 California Ave. SW, No. 171** **Seattle, WA 98116**	**(206) 937-5338**
AWPB	**American Wood Preservers Bureau** **4 E. Washington Street** **Newnan, GA 30263**	**(404) 254-9877**

AWS	**American Welding Society** **550 LeJeune Road, NW** **P.O. Box 351040** **Miami, FL 33135**	**(305) 443-9353**
AWWA	**American Water Works Association** **6666 West Quincy Avenue** **Denver, CO 80235**	**(303) 794-7711**
BHMA	**Builders' Hardware Manufacturers Association** **355 Lexington Ave., 17th Floor** **New York, NY 10017**	**(212) 661-4261**
BIA	**Brick Institute of America** **11490 Commerce Park Drive** **Reston, VA 22091**	**(703) 620-0010**
BIFMA	**Business and Institutional Furniture Manufacturers Assoc.** **2335 Burton Street, SE** **Grand Rapids, MI 49506**	**(616) 243-1681**
CAGI	**Compressed Air and Gas Institute** **c/o John H. Addington** **Thomas Associates, Inc.** **1300 Sumner Avenue** **Cleveland, OH 44115-2851**	**(216) 241-7333**
CAUS	**Color Association of the United States** **409 West 44th Street** **New York, NY 10036**	**(212) 582-6884**
CBM	**Certified Ballast Manufacturers Association** **Hanna Building, No. 772** **1422 Euclid Avenue** **Cleveland, OH 44115-2851**	**(216) 241-0711**
CCC	**Carpet Cushion Council** **P.O. Box 546** **Riverside, CT 06878**	**(203) 637-1312**
CDA	**Copper Development Association** **2 Greenwich Office Park, Box 1840** **Greenwich, CT 06836**	**(203) 625-8210**
CFFA	**Chemical Fabrics & Film Association, Inc.** **c/o Thomas Associates, Inc.** **1300 Sumner Avenue** **Cleveland, OH 44115-2851**	**(216) 241-7333**
CGA	**Compressed Gas Association** **1725 Jefferson Davis Highway, Suite 1004** **Arlington, VA 22202-4100**	**(703) 979-0900**

CISCA	**Ceiling and Interior Systems Construction Association** **5700 Old Orchard Road, 1st Floor** **Skokie, IL 60077**	**(708) 965-2776**
CISPI	**Cast Iron Soil Pipe Institute** **5959 Shallowford Road, Suite 419** **Chattanooga, TN 37421**	**(615) 892-0137**
CRI	**Carpet and Rug Institute** **P.O. Box 2048** **Dalton, GA 30722**	**(404) 278-3176**
CRSI	**Concrete Reinforcing Steel Institute** **933 Plum Grove Road** **Schaumburg, IL 60173**	**(708) 517-1200**
DHI	**Door and Hardware Institute** **14170 New Brook Drive** **Chantilly, VA 22022**	**(703) 222-2010**
DIPRA	**Ductile Iron Pipe Research Association** **245 Riverchase Parkway East, Suite O** **Birmingham, AL 35244**	**(205) 988-9870**
DLPA	**Decorative Laminate Products Association** **600 South Federal Street, Suite 400** **Chicago, IL 60605**	**(312) 922-6222**
ECSA	**Exchange Carriers Standards Association** **5430 Grosvenor Lane, Suite 200** **Bethesda, MD 20814**	**(301) 564-4505**
EIA	**Electronic Industries Association** **2001 Pennsylvania Avenue, NW** **Washington, DC 20006-1813**	**(202) 457-4900**
EIMA	**Exterior Insulation Manufacturers Association** **2759 State Road 580, Suite 112** **Clearwater, FL 34621**	**(813) 726-6477**
EJMA	**Expansion Joint Manufacturers Association** **25 North Broadway** **Tarrytown, NY 10591**	**(914) 332-0040**
ETL	**ETL Testing Laboratories, Inc.** **P.O. Box 2040** **Route 11, Industrial Park** **Cortland, NY 13045**	**(607) 753-6711**
FCI	**Fluid Controls Institute** **P.O. Box 9036** **Morristown, NJ 07960**	**(201) 829-0990**

FCIB	**Floor Covering Installation Board** **310 Holiday Avenue** **Dalton, GA 30720**	**(706) 226-5488**
FGMA	**Flat Glass Marketing Association** **White Lakes Professional Building** **3310 Southwest Harrison** **Topeka, KS 66611-2279**	**(913) 266-7013**
FM	**Factory Mutual Research Organization** **1151 Boston-Providence Turnpike** **P.O. Box 9102** **Norwood, MA 02062**	**(617) 762-4300**
GA	**Gypsum Association** **810 First Street, NE, Suite 510** **Washington, DC 20002**	**(202) 289-5440**
HEI	**Heat Exchange Institute** **c/o John H. Addington** **Thomas Associates, Inc.** **1300 Sumner Avenue** **Cleveland, OH 44115-2851**	**(216) 241-7333**
HI	**Hydronics Institute** **P.O. Box 218** **35 Russo Place** **Berkeley Heights, NJ 07922**	**(908) 464-8200**
H.I.	**Hydraulic Institute** **30200 Detroit Road** **Cleveland, OH 44145-1967**	**(216) 899-0010**
HMA	**Hardwood Manufacturers Assoc.** **400 Penn Center Blvd.** **Pittsburgh, PA 15235**	**(412) 829-0770**
HPMA	**Hardwood Plywood Manufacturers Assoc.** **1825 Michael Farraday Drive** **P.O. Box 2789** **Reston, VA 22090-2789**	**(703) 435-2900**
IBD	**Institute of Business Designers** **341 Merchandise Mart** **Chicago, IL 60654**	**(312) 647-1950**
ICEA	**Insulated Cable Engineers Association, Inc.** **P.O. Box 440** **South Yarmouth, MA 02664**	**(508) 394-4424**

IEC	**International Electrotechnical Commission** **(Available from ANSI)** **1430 Broadway** **New York, NY 10018**	**(212) 354-3300**
IEEE	**Institute of Electrical and Electronic Engineers** **345 East 47th Street** **New York, NY 10017**	**(212) 705-7900**
IESNA	**Illuminating Engineering Society of North America** **345 East 47th Street** **New York, NY 10017**	**(212) 705-7926**
IGCC	**Insulating Glass Certification Council** **c/o ETL Testing Laboratories, Inc.** **P.O. Box 2040** **Route 11, Industrial Park** **Cortland, NY 13045**	**(607) 753-6711**
IMSA	**International Municipal Signal Association** **165 East Union Street** **P.O. Box 539** **Newark, NY 14513**	**(315) 331-2182**
IRI	**Industrial Risk Insurers** **85 Woodland Street** **Hartford, CT 06102**	**(203) 520-7300**
ISA	**Instrument Society of America** **P.O. Box 12277** **67 Alexander Drive** **Research Triangle Park, NC 27709**	**(919) 549-8411**
KCMA	**Kitchen Cabinet Manufacturers Association** **1899 Preston White Drive** **Reston, VA 22091-4326**	**(703) 264-1690**
LIA	**Lead Industries Association, Inc.** **295 Madison Avenue** **New York, NY 10017**	**(212) 578-4750**
LPI	**Lightning Protection Institute** **3365 North Arlington Heights Road, Suite J** **Arlington Heights, IL 60004**	**(708) 255-3003**
MCAA	**Mechanical Contractors Association of America** **1385 Piccard Drive** **Rockville, MD 20850-4329**	**(301) 869-5800**

ML/SFA	**Metal Lath/Steel Framing Association** **(A Division of the National Association** **of Architectural Metal Manufacturers)** **600 South Federal Street, Suite 400** **Chicago, IL 60605**	**(312) 922-6222**
MSS	**Manufacturers Standardization Society of** **the Valve and Fittings Industry** **127 Park Street, NE** **Vienna, VA 22180**	**(703) 281-6613**
NAAMM	**National Association of Architectural** **Metal Manufacturers** **600 South Federal Street, Suite 400** **Chicago, IL 60605**	**(312) 922-6222**
NAIMA	**North American Insulation Manufacturers Association** **44 Canal Center Plaza, Suite 310** **Alexandria, VA 22314**	**(703) 684-0084**
NBHA	**National Builders Hardware Association** **(Now DHI)**	
NCMA	**National Concrete Masonry Association** **P.O. Box 781** **Herndon, VA 22070-0781**	**(703) 435-4900**
NCRPM	**National Council on Radiation Protection** **and Measurements** **7910 Woodmont Avenue, Suite 800** **Bethesda, MD 20814**	**(301) 657-2652**
NCSPA	**National Corrugated Steel Pipe Association** **2011 Eye Street, NW** **Washington, DC 20006**	**(202) 223-2217**
NEC	**National Electrical Code (from NFPA)**	
NECA	**National Electrical Contractors Association** **7315 Wisconsin Avenue** **Bethesda, MD 20814**	**(301) 657-3110**
NEMA	**National Electrical Manufacturers Association** **2101 L Street, NW, Suite 300** **Washington, DC 20037**	**(202) 457-8400**
NETA	**International Electrical Testing Association** **P.O. Box 687** **Morrison, CO 80465**	**(303) 467-0526**

NFPA	**National Fire Protection Association** **One Batterymarch Park** **P.O. Box 9101** **Quincy, MA 02269-9101**	**(617) 770-3000** **(800) 344-3555**
N.F.P.A.	**National Forest Products Association** **1250 Connecticut Avenue, NW, Suite 200** **Washington, DC 20036**	**(202) 463-2700**
NHLA	**National Hardwood Lumber Association** **P.O. Box 34518** **Memphis, TN 38184-0518**	**(901) 377-1818**
NKCA	**National Kitchen Cabinet Association** **(Now KCMA)**	
NLGA	**National Lumber Grades Authority** **1055 West Hastings Street, Suite 260** **Vancouver, British Columbia** **Canada V6E 2E9**	**(604) 687-2171**
NOFMA	**National Oak Flooring Manufacturers Association** **P.O. Box 3009** **Memphis, TN 38173-0009**	**(901) 526-5016**
NPA	**National Particleboard Association** **18928 Premiere Court** **Gaithersburg, MD 20879**	**(301) 670-0604**
NPCA	**National Paint and Coatings Association** **1500 Rhode Island Avenue, NW** **Washington, DC 20005**	**(202) 462-6272**
NRCA	**National Roofing Contractors Association** **10255 West Higgins Road, Suite 600** **Rosemont, IL 60018-5607**	**(708) 299-9070**
NSF	**National Sanitation Foundation** **3475 Plymouth Road** **P.O. Box 1468** **Ann Arbor, MI 48106**	**(313) 769-8010**
NWMA	**National Woodwork Manufacturers Association** **(Now NWWDA)**	
NWWDA	**National Wood Window and Door Association** **1400 East Touhy Avenue, #G54** **Des Plaines, IL 60018**	**(708) 299-5200**
PCA	**Portland Cement Association** **5420 Old Orchard Road** **Skokie, IL 60077**	**(708) 966-6200**

PCI	**Precast/Prestressed Concrete Institute** **175 West Jackson Blvd.** **Chicago, IL 60604**	**(312) 786-0300**
PDI	**Plumbing and Drainage Institute** **c/o Sol Baker** **1106 West 77th Street, South Drive** **Indianapolis, IN 46260**	**(317) 251-6970**
PEI	**Porcelain Enamel Institute** **1101 Connecticut Avenue, NW, Suite 700** **Washington, DC 20036**	**(202) 857-1134**
RFCI	**Resilient Floor Covering Institute** **966 Hungerford Drive, Suite 12-B** **Rockville, MD 20805**	**(301) 340-8580**
RIS	**Redwood Inspection Service** **405 Enfrente Drive, Suite 200** **Novato, CA 94949**	**(415) 382-0662**
RMA	**Rubber Manufacturers Association** **1400 K Street, NW** **Washington DC 20005**	**(202) 682-4800**
SDI	**Steel Deck Institute** **P.O. Box 9506** **Canton, OH 44711**	**(216) 493-7886**
S.D.I.	**Steel Door Institute** **30200 Detroit Road** **Cleveland, OH 44145**	**(216) 889-0010**
SGCC	**Safety Glazing Certification Council** **c/o ETL Testing Laboratories** **Route 11, Industrial Park** **Cortland, NY 13045**	**(607) 753-6711**
SHLMA	**Southern Hardwood Lumber Manufacturers Association (Now HMA)**	
SIGMA	**Sealed Insulating Glass Manufacturers Association** **401 North Michigan Avenue** **Chicago, IL 60611**	**(312) 644-6610**
SMA	**Screen Manufacturers Association** **3950 Lake Shore Drive, Suite 502-A** **Chicago, IL 60613-3431**	**(312) 525-2644**
SMACNA	**Sheet Metal and Air Conditioning Contractors National Association** **4201 Lafayette Center Drive** **Chantilly, VA 22021**	**(703) 803-2980**

SPIB	**Southern Pine Inspection Bureau** **4709 Scenic Highway** **Pensacola, FL 32504**	**(904) 434-2611**
SPRI	**Single Ply Roofing Institute** **20 Walnut Street** **Wellesley Hills, MA 02189**	**(617) 237-7879**
SSPC	**Steel Structures Painting Council** **4400 Fifth Avenue** **Pittsburgh, PA 15213-2683**	**(412) 268-3327**
SSPMA	**Sump and Sewage Pump Manufacturers Association** **P.O. Box 298** **Winnetka, IL 60093**	**(708) 835-8911**
SWI	**Steel Window Institute** **c/o Thomas Associates, Inc.** **1300 Sumner Ave,** **Cleveland, OH 44115-2851**	**(216) 241-7333**
SWPA	**Submersible Wastewater Pump Association** **600 South Federal Street, Suite 400** **Chicago, IL 60605**	**(312) 922-6222**
TIMA	**Thermal Insulation Manufacturers Association** **29 Bank Street** **Stamford, CT 06901** **(Standards now issued by NAIMA)**	**(203) 324-7533**
TPI	**Truss Plate Institute** **583 D'Onofrio Drive, Suite 200** **Madison, WI 53719**	**(608) 833-5900**
UFAC	**Upholstered Furniture Action Council** **Box 2436** **High Point, NC 27261**	**(919) 885-5065**
UL	**Underwriters Laboratories, Inc.** **333 Pfingsten Road** **Northbrook, IL 60062**	**(708) 272-8800**
USP	**U.S. Pharmacopoeial Convention** **12601 Twinbrook Parkway** **Rockville, MD 20852**	**(301) 881-0666**
WCLIB	**West Coast Lumber Inspection Bureau** **P.O. Box 23145** **Portland, OR 97223**	**(503) 639-0651**

WCMA	**Wallcovering Manufacturers Association** **355 Lexington Avenue, 17th Floor** **New York, NY 10017** **(WCMA has moved from this location, perhaps to the Chicago area. Address and telephone number not confirmed.)**	**(212) 661-4261**
WIC	**Woodwork Institute of California** **P.O. Box 11428** **Fresno, CA 93773-1428**	**(209) 233-9035**
WRI	**Wire Reinforcement Institute** **1101 Connecticut Avenue NW, Suite 700** **Washington, DC 20036-4303**	**(202) 429-5125**
WSC	**Water Systems Council** **600 South Federal Street, Suite 400** **Chicago, IL 60605**	**(312) 922-6222**
WSFI	**Wood and Synthetic Flooring Institute** **4415 West Harrison Street, Suite 242-C** **Hillside, IL 60162**	**(708) 449-2933**
WLPDIA	**Western Lath, Plaster, Drywall Industries Association** **(Formerly California Lath & Plaster Association)** **8635 Navajo Road** **San Diego, CA 92119**	**(619) 466-9070**
WWPA	**Western Wood Products Association** **Yeon Building** **522 SW 5th Avenue** **Portland, OR 97204-2122**	**(503) 224-3930**
W.W.P.A.	**Woven Wire Products Association** **2515 North Nordica Avenue** **Chicago, IL 60635**	**(312) 637-1359**

G. Federal Government Agencies: Names and titles of federal government standard or Specification-producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard or Specification-producing agencies of the federal government. Names and addresses are subject to change but are believed to be, but are not assured to be, accurate and up to date as of the date of the Contract Documents.

CE	**Corps of Engineers** **(U.S. Department of the Army)** **Chief of Engineers – Referral** **Washington, DC 20314**	**(202) 272-0660**

CFR	**Code of Federal Regulations** **(Available from the Government Printing Office)** **North Capitol Street between G and H Streets, NW** **Washington, DC 20402** **(Material is usually first published in the "Federal Register")**	**(202) 783-3238**
CPSC	**Consumer Product Safety Commission** **5401 Westbard Avenue** **Bethesda, MD 20207**	**(301) 492-6580** **(800) 638-2772**
CS	**Commercial Standard** **(U.S. Department of Commerce)** **Washington, DC 20230**	**(202) 482-2000**
DOC	**U.S. Department of Commerce** **14th Street and Constitution Avenue, NW** **Washington, DC 20230**	**(202) 482-2000**
DOT	**Department of Transportation** **400 Seventh Street, SW** **Washington, DC 20590**	**(202) 366-4000**
EPA	**Environmental Protection Agency** **401 M Street, SW** **Washington, DC 20460**	**(202) 382-2090**
FAA	**Federal Aviation Administration** **(U.S. Department of Transportation)** **800 Independence Avenue, SW** **Washington, DC 20590**	**(202) 366-4000**
FCC	**Federal Communications Commission** **1919 M Street, NW** **Washington, DC 20554**	**(202) 632-7000**
FHA	**Federal Housing Administration** **(U.S. Department of Housing and Urban Development)** **Director, Manufactured Housing and Construction Standards Division** **451 Seventh Street, SW, Room 9158** **Washington, DC 20201**	**(202) 755-5210**
FS	**Federal Specification (from GSA)** **Specifications Unit (WFSIS)** **7th and D Streets, SW** **Washington, DC 20407**	**(202) 708-9205**
GSA	**General Services Administration** **F and 18th Streets, NW** **Washington, DC 20405**	**(202) 708-5082**

MIL	**Military Standardization Documents** **(U.S. Department of Defense)** **Naval Publications and Forms Center** **5801 Tabor Avenue** **Philadelphia, PA 19120**	
NIST	**National Institute of Standards and Technology** **(U.S. Department of Commerce)** **Gaithersburg, MD 20899**	**(301) 975-2000**
OSHA	**Occupational Safety and Health Administration** **(U.S. Department of Labor)** **N3647** **200 Constitution Avenue, NW** **Washington, DC 20210**	**(202) 219-8148**
PS	**Product Standard of NBS** **(U.S. Department of Commerce)** **Washington, DC 20230**	**(202) 482-2000**
REA	**Rural Electrification Administration** **(U.S. Department of Agriculture)** **14th Street and Independence Avenue, SW** **Washington, DC 20250**	**(202) 447-2791**
USDA	**U.S. Department of Agriculture** **14th Street and Independence Avenue, SW** **Washington, DC 20250**	**(202) 447-2791**
USPS	**U.S. Postal Service** **475 L'Enfant Plaza, SW** **Washington, DC 20260-0010**	**(202) 268-2000**

1.5 GOVERNING REGULATIONS AND AUTHORITIES

A. Copies of Regulations: Obtain copies of governing regulations and retain them at the Project site to be available for reference by parties who have a reasonable need, if requested by the Architect.

1.6 SUBMITTALS

A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made a part of this Section.

1.2 SUMMARY

A. This Section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security, and protection.

B. Temporary utilities required include, but are not limited to:
   1. Temporary power and lighting as specified in Division 260000.
   2. Temporary heat & winter conditions.

C. Temporary construction and support facilities required include, but are not limited to:
   1. Waste disposal services.
   2. Temporary yard and storage on and off-site.
   3. Construction aids and miscellaneous services and facilities.
   4. Sweeping compound.
   5. Emergency portable generators of size required if permanent power is temporarily unavailable.
   6. Water service and distribution if water supply to adjacent occupied spaces is temporarily unavailable.
   7. Parking

D. Security and protection facilities required include, but are not limited to:
   1. Temporary weather protection, enclosures, and covers.
   2. Temporary fire protection and fire watch if required by Worcester Fire Deparment.
   3. Barricades, warning signs, lights.
   4. Temporary partitions between occupied areas and construction areas, STC 48 or better.

E. Where a distinction is made in this specification section between temporary services to be provided by a General Contractor and those to be provided by a Subcontractor, the purpose is only to clarify which costs are to be included by the applicable parties for inclusion in the applicable bids and contracts that would follow. These distinctions have no bearing upon the Contract between the Owner and General Contractor and do not limit in any way the General Contractor's responsibility to provide all such temporary services without additional cost to the Owner. For the sake of clarity in this specification section, the term General Contractor has been used for the person called the Contractor in other specification sections, when the intent is that that person shall provide a service directly at his own expense rather than at the expense of one of the Subcontractors from whom the Owner has taken filed sub-bids.

F. The temporary services describe in this specification section may not be adequate to provide for all of the needs of the General Contractor or all Subcontractors, but are intended only to provide a basis for obtaining filed sub-bids. The General Contractor or any Subcontractor requiring additional temporary services for the proper execution of his work or because of climatic conditions shall arrange for and obtain such services at his own expense without further compensation by the Owner.

G. The Contractor shall be responsible for restoring all landscaped areas affected by the work of this project to their original "like-new" state that existed prior to work commencing. This restoration work shall include, but not be limited to, planting beds with mulch, trees, shrubs, and lawn areas. Great care should be taken during the course of the work not to damage nor destroy any landscaping impacted by this work. Any landscaping disturbed, damaged, or destroyed shall be restored, repaired, or replaced in-kind at no cost to the Owner.

1.3 SUBMITTALS

A. Schedule: Submit a schedule indicating implementation and termination of each temporary utility within fifteen (15) days of the date established for Commencement of the Work.

1.4 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
   1. Commonwealth of Massachusetts State Building Code requirements; 6th Edition.
   2. Federal, State and City Health and safety regulations.
   3. Utility company regulations.
   4. Police, Fire Department and Rescue Squad rules.
   5. Environmental protection regulations.

B. Standards: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
   1. NFPA Code 241.
   2. NFPA 70.
   3. ANSI A10.
   4. NECA NJG-6.

C. Electric Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.

D. Inspections: Arrange for authorities having jurisdiction to inspect and test temporary utilities prior to use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Utilities: At the earliest feasible time, when acceptable to Owner, change from use of temporary service to use of permanent service.

B. Conditions of Use: Maintain temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload temporary facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous, unsanitary conditions, or public nuisances to develop or persist on the site.

C. Always maintain the continuity of all utility services across all Phases of the Construction Project, unless otherwise directed by the Architect or Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials suitable for the use intended, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.2 TEMPORARY WATER

A. Definitions:

1. Water Access Point: A point, within the Project area, at which water is available during construction.

B. Charges: The General Contractor shall pay for all facilities to provide water during construction, while the Owner will supply and pay for water during the construction. The General Contractors shall pay for backflow preventer if utilizing Owners Hydrant for water.

1. The furnishing of water by the Owner shall be conditional upon all contractors being conservative and prudent in its use. In the event of any contractor is repeatedly wasteful in the use of water thus provided, the Owner reserves the right to charge the General Contractor for wasteful usage at an equitable rate for the additional portion of water used.

C. Temporary Water: The General Contractor shall be responsible for all facilities to provide water during construction as defined above and further specified as follows:

1. Except under unusual circumstances, when otherwise specified or approved by the Architect, all water shall be of potable quality.
2. The General Contractor shall provide all necessary piping, valving, hose bibbs, hosing, etc. to provide temporary water during construction from a water access point determined by the Owner's Representative. Any facilities running within the building are required not to leak. Any damage incurred due to leaks shall be repaired at the expense of the General Contractor.
3. The General Contractor shall pay for and be responsible for the protection of Temporary Water, which he installs, from freezing and other damage.

2.3 TEMPORARY HEAT

A. Definitions:

1. Temporary Heating & Ventilating: The General Contractor shall provide temporary heat and ventilation, as needed, to work areas outside the building to maintain minimum temperatures described below. The General Contractor shall also provide temporary heat and ventilation, as needed, to work areas inside the building to maintain an indoor temperature of 68 degrees Fahrenheit during the winter months and 75 degrees Fahrenheit during the summer months.

B. Charges: The General Contractor shall pay for all temporary heat and ventilation as defined above. The General Contractor shall pay for all fuel required for Temporary Heat and Ventilation. The Owner shall pay for all electrical energy use charges.

1. The furnishing of electrical energy by the Owner shall be conditional upon being conservative and prudent in its use. In the event that any contractor is repeatedly wasteful in the use of electrical energy thus provided, the Owner reserves the right to charge the General Contractor at an equitable rate for the additional portion of electrical energy used.

C. Temporary Heating: Portable heating units shall be of sufficient capacity and number and shall be located so that damage to any part of the project from low temperature will be prevented and that concrete, masonry, and other components requiring curing shall be properly cured.

1. Heaters for temporary heat shall be temporary steam generators, forced air heaters, or other type heaters located outside the building or vented to the outside of the building. Type(s) shall be such as to not damage or stain construction or any part of the existing building. Heaters must be UL approved.
2. At no time will oil-burning “salamander” type heaters be used, nor will non-vented, open flame heaters be used inside the building.
3. Propane-type heaters shall not be used at any time within the area of the building or near stockpiles of combustible materials.
4. Temporary heating shall apply to winter conditions.

D. Temporary Ventilation: Portable ventilation units shall be of sufficient capacity and number and shall be located so that damage to any part of the project from excess humidity will be prevented and that concrete, masonry, and other components requiring curing shall be properly cured.

2.4 TEMPORARY POWER AND LIGHTING

A. Definitions:

1. Temporary Electric: The furnishing, installing, maintenance, and removal of all wiring, fusing, switches, outlets, lamps, and accessory electrical devices required to provide lighting and power needed by all construction trades for the duration of construction.

B. Charges: The General Contractor shall pay for all facilities for Temporary Electric. The Owner shall pay for all use charges for electrical energy.

1. The furnishing of electrical energy by the Owner shall be conditional upon all contractors being conservative and prudent in its use. In the event that any contractor is repeatedly wasteful in the use of electrical energy thus provided, the Owner reserves the right to charge the General Contractor at an equitable rate for the additional portion of energy consumed.

C. Temporary Electricity: The General Contractor shall pay for and be responsible for Temporary Electric as defined above and further specified as follows:

1. The General Contractor shall provide temporary electricity during construction from an electrical service access point determined by the Owner's Representative.
2. The Temporary Electricity is expected to be used during normal working hours, as defined in Section 01010 – Summary of Work. No additional charge shall be made by the General Contractor for switching the system on and off to meet this time requirement.
3. Responsibility of compliance with local, state, and national codes for installation of the Temporary Electric service shall be borne by the General Contractor.
4. The General Contractor shall be responsible to service and maintain all temporary lighting during the construction.
5. The General Contractor shall be responsible to pay for the following Temporary Electricity. This schedule will not necessarily provide for all requirements of all contractors. The General Contractor or any Subcontractor having requirements for power, lighting, or service other than those provided herein, shall make the necessary arrangements to obtain such power, lighting, or service at his own expense.
    a. The General Contractor shall obtain all necessary permits, shall furnish and install the temporary electrical power and lighting systems, and shall pay for all labor, materials, and equipment required for this work. All such temporary electrical work shall meet the requirements of the Massachusetts Electrical Code and OSHA.
    b. The Electrical Subcontractor shall furnish and install a feeder, or feeders, of sufficient capacity to provide additional lighting to the work areas, as required, to properly carryout the work. Temporary lighting shall be based on the following requirements:
        1) Rooms or spaces under 250 square feet: Two (2) 100-watt lamps.
        2) Rooms or spaces over 250 square feet and under 500 square feet: Four (4) 100-watt lamps.
        3) Rooms or spaces over 500 square feet and under 1,000 square feet: Two (2) 200-watt lamps.
        4) Rooms or spaces over 1,000 square feet: Two (2) 200-watt lamps for every 1,000 square feet or fraction thereof.
        5) Sufficient additional wiring outlets and lamps shall be installed to insure proper lighting in stairwells, corridors, and passage areas.
        6) Temporary power, in addition to the lighting requirements, shall be provided throughout the building for electrically operated tools, based on a minimum of 0.50 watts per square foot.
        7) Outlets shall be located at convenient points so that extension cords of not over 50 feet in length will reach all work requiring light or power.
        8) All Electrical Outlets shall be properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light, for connection of power tools and equipment.

9) All Electrical Power Cords shall be grounded extension cords that are "hard-service" type where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

c. All necessary cables, load centers, switches, and accessories required for the temporary light and power installation shall be provided and installed by the General Contractor.

d. The General Contractor shall furnish and install all lamps, both initial and replacement until the Date of Substantial Completion.

e. Temporary light and power requirements herein required are for the use of all trades working at the site.

f. All Contractors and Subcontractors shall, individually, furnish all extension cords and lamps, sockets, motors, and accessories required for their work.

1) All Electrical Power Cords shall be grounded extension cords that are "hard-service" type where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

g. Any of the Contractors or Subcontractors shall reimburse the General Contractor for any of the following:

1) Any temporary wiring of a special nature, other than that specified above, required for their work.

2) Any temporary wiring of construction offices and buildings used by them.

3) Any temporary wiring for protective night lighting.

h. The General Contractor shall be responsible for removing all temporary wiring, service equipment, and accessories when and as directed to by the General Contractor.

i. The provisions of the Massachusetts Electrical Code shall be strictly complied to, with special respect to Article 305 of said code, and the following precautions shall be taken:

1) Open conductors shall be fastened at the ceiling height at minimum of 10 feet intervals. Conductors may not be laid on the floor, and receptacles or fixed equipment circuits shall contain a separate equipment-grounding conductor if run as open wiring. Receptacles shall be of the grounding type. Branch circuits shall also be of the grounding type, unless installed in a complete metallic conductor and receptacles electrically connected to the grounding conductor. Neither bare conductors nor earth returns shall be used for wiring of any temporary circuits. Grounding circuits shall never be interrupted.

2) All 15 and 20 amp receptacle outlets on single phase circuits which are used for construction purposes shall be equipped with ground-fault circuit interrupters, reset button, and pilot lights; as required by Article 210 of the Massachusetts Electrical Code.

3) All outlets shall be properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets.

2.5 TEMPORARY SANITARY FACILTIES

1. The General Contractor shall provide ample toilet facilities with proper enclosures for the use of workmen employed on the work to be as located within the construction areas on site were permitted by the Architect.
   a. Provide the Architect with a schedule of maintenance and cleaning. Provide toilet facilities with hand washing sanitizer dispenser, paper towels, and cleaners.
   b. Toilet facilities shall be installed and maintained in conformity with the governing laws and building code. They shall be properly lit, ventilated, and kept clean at all times.
   c. At no time shall any Contractor Personnel use toilet facilities outside the work areas or in any Owner-occupied parts of the building.

2.6 TEMPORARY WEATHER PROTECTION

A. Definitions:
   1. Weather Protection: The furnishing, installing, maintenance, and removal of temporary closures, covers, shields, and any other weather protection devices as required to protect work in place and permit construction to proceed during cold or inclement weather.

B. Weather Protection Standard: The following weather protection standards pursuant to Chapter 597 of the Acts of 1980, modifying Sections 44F and G of Chapter 149 of the General Laws, are hereby incorporated into this specification, and shall be considered supplementary to the temporary heating and temporary enclosure requirements. Under the provisions of Chapter 149, Section 44F(I) and Section 44G, Paragraph D, of the General Laws, General Contractors are required to provide weather protection to allow building construction to be carried on during the months of November through March. These standards do not require enclosures for heat for operations that are not economically feasible to protect in the judgment of the Awarding Authority; including for example, site work, excavation, pile driving, steel erection, erection of certain exterior panels, roofing, and the like.
   1. The General Contractor shall provide and install weather protection.
   2. Weather protection shall be provided during the months of November through March.
   3. Temperature at the working surface shall be at least forty degrees Fahrenheit (40° F). This provision does not supersede any specific greater requirements for the methods of construction or curing of materials.
   4. Weather protection materials, equipment, and the installation thereof, shall comply with all safety rules and regulations including the provisions for adequate ventilation and fire protection devices.
   5. At completion of work, the General Contractor shall remove temporary weather protection and restore all surfaces to first class condition.
   6. The General Contractor may choose, if the Awarding Authority approves, to use the permanent heating system for temporary heat after the building is enclosed and the system has been tested and is ready to operate.
      a. The General Contractor shall thoroughly clean and restore to first class condition, acceptable to the Awarding Authority, all portions of the permanent heating system that are used for heating during construction.

b. Use of the permanent heating system for weather protection shall not affect any heating system guarantee that may be due to the Awarding Authority; such guarantee shall begin to run only when the Awarding Authority accepts the building.

7. Reporting Requirements:
   a. Within thirty (30) calendar days after Contract Award the General Contractor shall submit, in writing to the Awarding Authority for approval, its proposed plan for weather protection. Refer to Section 01300 – Submittals for additional information regarding the appropriate procedure in preparing this submittal.
   b. The General Contractor shall furnish and install accurate Fahrenheit thermometers at places designated by the Awarding Authority to determine whether the required temperature is being maintained.

C. Temporary Covers and Enclosures:
1. Except as otherwise specified herein below, all costs of closing openings in new construction and the exterior of the existing buildings were opened to the weather, including temporary covers and enclosures, shall be borne by the General Contractor. Enclosures must be built around various portions of the new construction and new exterior openings in the existing building as the work progresses if, and as necessary to totally insure against the intrusion of rain, snow, and other moisture which might damage the new or existing materials or finishes and as necessary to maintain the minimum temperatures specified.
   a. Where roofs, exterior walls, windows, or other elements of new or existing buildings or structures providing weather protection are to be temporarily opened to the weather, they shall be fully enclosed or covered with securely attached and well-draining enclosures whenever inclement weather is occurring or is threatening, to assure absolute weather protection. Any and all damage to the new or existing buildings or structures, including all materials and finishes thereon, caused by inadequate protection shall be made good by the General Contractor without further cost to the Owner.
2. All such weather tight enclosures shall provide a reasonable open area to permit drying of new wet materials while at the same time making it possible to maintain the required interior temperatures. The General Contractor shall provide sufficient continuous ventilation until the time that the "wet" work of the project has dried sufficiently to receive finished woodwork and other materials subject to moisture damage, at which time the ventilation shall be maintained at approximately the anticipated conditions of final use of the project.
3. The permanent doors and frames shall not be used as temporary enclosures prior to the time of delivery of finished woodwork or acoustical materials. Temporary wood or plywood doors with wood frames and proper hardware to make the doors self-closing shall be provided, instead, at the door openings.

4. As parts of the temporary enclosures, the permanent doors, windows, and fixed glass may be used, provided sufficient ventilation area is available and that extreme care is taken to prevent damage to the same. Where available ventilation area is limited, intake and discharge fans may be used to increase air movement through the construction areas. Before delivery of finished woodwork or other materials subject to moisture damage, the permanent windows, roof accessories, fixed glass, doors, and entrances must be in place. Spark-proof fans shall also be provided to remove toxic or obnoxious fumes from enclosed areas as may be required.
5. Once temporary enclosures are in place, a temperature of at least 55 degrees Fahrenheit shall be maintained within all interior workspaces. From time of delivery of first shipment of finished woodwork or other finished materials subject to moisture damage, a temperature of at least 60 degrees Fahrenheit shall be maintained within all interior spaces. Temperatures shall be maintained at this level until time of substantial completion of the project or occupancy by the Owner, whichever is sooner, and shall not be discontinued until definite arrangements for same have been made by the Owner.

D. Weather Protection by Subcontractors: The General Contractor shall provide at his own expense all Weather Protection as defined above except as follows:
1. Each Subcontractor shall pay for and be responsible for the weather protection of his tools, devices, equipment, appliances, and appurtenances to use in the accomplishment of his work and for weather protection of materials furnished by him until such materials are incorporated as a physical part of the Project.
2. Protection and heating of aggregates and water for concrete and mortars shall be the responsibility and at the expense of the respective Subcontractors furnishing concrete and mortars.
3. Construction Water Facilities, furnished and installed by the General Contractor, shall be protected against freezing by the Contractor at his own expense.
4. Hoses, piping, and accessory devices installed and connected by others to the water facilities furnished by the Contractor shall be protected against freezing by the installer at his own expense.

2.7 TEMPORARY FIRE PROTECTION

A. The General Contractor shall take all necessary precautions for the prevention of fire during construction. He shall be responsible that the area within the contract limits is kept orderly and clean and that combustible rubbish is promptly removed from the site. Combustible materials shall be stored on site in a manner and at locations approved by the Architect. The General Contractor shall comply with all suggestions regarding fire protection made by the Insurance Company with which the Owner maintains his fire insurance.

B. The General Contractor shall provide and maintain in good working order, under all conditions, readily available to all portions of the site and work, suitable and adequate fire protection equipment and services. Such facilities shall include, but are not limited to, the furnishing and maintaining in good working order a minimum of two (2) standard, Underwriters' Laboratories labeled, 2-1/2 gallon capacity fire extinguishers per floor.

C. Smoking shall be prohibited on the premises and signs to this effect shall be posted conspicuously.

D. Fires shall not be built on the premises.

2.8 TEMPORARY CRANES, LIFTS, DERRICKS, AND HOISTING SERVICES

A. The General Contractor shall furnish, install, operate, and maintain in safe condition all crane services outside of the building for his own use and for the use of all Subcontractors on the project to properly carry out and complete the work, except as may otherwise be specifically provided for in any of the trade sections of the Specifications.

B. All crane services shall be provided at no cost to the Subcontractors for their work.

C. Each Subcontractor shall, however, provide their own lifts, derricks, hoisting services, etc. (excluding crane services outside the building) for their own work outside and inside the building to properly complete their work.

D. All cranes, lifts, derricks, and hoisting equipment, machinery, and operation shall comply in all respects to the governing laws and codes.

2.9 TEMPORARY STAGING AND SCAFFOLDING

A. The General Contractor shall furnish, erect, and maintain in safe condition all exterior and interior staging and scaffolding required for his own use.

B. Each of the Subcontractors shall furnish, erect, and maintain in safe condition all exterior and interior staging and scaffolding for their own use.

C. All staging and scaffolding shall be enclosed at the ground by a temporary construction fence as defined elsewhere in this Section.

D. Staging and scaffolding shall comply in all respects to the governing laws and codes.

2.10 TEMPORARY BRACING, SHORING, SHEETING, AND TIE-DOWNS

A. The General Contractor shall take all precautions to protect the Work against collapse or other damage by earth or construction loads, high winds, snow and rain loads, damage by adverse weather conditions or geological disturbances, or other cause, by temporary bracing shoring, sheeting, guying, lacing, covering, weighting, and other reasonable and prudent means.

2.11 TEMPORARY STAIRS, LADDERS, RAMPS, PLATFORMS, ETC.

A. The General Contractor shall provide and maintain all necessary temporary stairs, ladders, ramps, platforms, and other temporary construction required for the proper execution of the work, all of which shall comply with requirements of the governing laws and codes and/or as required by local building officials.

B. As soon as the permanent ladders and hatches are installed, the General Contractor shall provide temporary protective measures acceptable to the Architect to maintain their new condition until substantial completion, so to assure that such items will not be damaged as the remaining work progresses.

2.12 TEMPORARY FENCING, BARRIERS, AND PARTITIONS

A. Protection: The General Contractor shall be fully responsible for the security of the work areas of the site and for patrolling and protecting the work under construction and his and the Owner's materials stored or otherwise located on the site.

B. Temporary Barricading: In addition, the General Contractor shall provide other temporary fencing, barricading, and overhead protection of substantial nature to protect workmen, other personnel, and the public against various hazards and attendant nuisances that come about as the work progresses such as, but not necessarily limited to, falling materials, dangerous excavations, dangerous projections or obstructions, stored or stockpiled materials, etc. Comply fully with recommendations of the Association of General Contractors and provisions of the governing laws and codes.

Note: As part of requirement for overhead protection, include substantial, well-constructed, walkways cover sufficient to assure pedestrian safety, in accordance with recommendations of the Association of General Contractors and provisions of the governing laws and codes.

C. In addition, the General Contractor shall provide all necessary protective barriers within the existing building as required to assure the safety of persons and property wherever work on this Contract is being carried out. Include substantial, well-constructed, protective barriers at all construction work-limit-lines separating Contract work areas from areas occupied by the Owner. Also include flameproof dust-curtaining and block or filter mechanical return air systems in a safe manner, in cooperation with Mechanical trade, between areas where dust effusive work is being carried out and other interior areas of the new addition and existing building to prevent passage of dirt and dust. Barriers, curtaining, etc., must be self-supporting, and must not depend on building construction for primary structure or anchorage. Locations and quantities of barriers and dust curtaining shall at all times be subject to Owner's and Architect's approval, but such approval, or lack of inspection or approval, by the Owner or the Architect, shall not be construed as relieving the Contractor of any of his responsibilities under the Contract.

2.13 TEMPORARY STORAGE FACILITIES

A. Space for storage of materials shall be confined to the construction areas outside the building and as designated and/or approved by the Architect.

B. Locations where construction equipment may be stored during non-working hours shall be as acceptable to the Owner. Construction equipment shall not present a hazard when stored.

2.14 NOISE, DUST, AND POLLUTION CONTROL

A. All work performed under the Contract shall conform to the requirements of Chapter III, Section 31C and Section 142D of the General Laws, Commonwealth of Massachusetts and Rules and Regulations adopted thereto by the Commonwealth of Massachusetts, Department of Public Health, and the requirements of local noise, dust, and pollution control laws, ordinances, and regulative agencies applicable to the work.

B. The General Contractor shall provide temporary partitions to prevent noise, dust, pollution or order from entering occupied spaces. Temporary partitions shall have STC of 50. Submit location plan and type of construction for temporary partitions for approval.

C. Control of air borne dust or pollution from the site with spray or as otherwise may be necessary to prevent the migration of any dust or pollutants.

D. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, or pollution.
2. Vacuum equipment shall be equipped with HEPA filters.
3. Vacuum carpeted areas.
4. Wet mop floors to eliminate trackable dirt.
5. Sweeping shall be allowed only with the use of a non-oil based sweeping compound followed by vacuuming any remaining residue.
6. Wipe down walls and doors of demolition enclosure.

E. Disposal: Remove and transport debris, in a manner that will prevent spillage on adjacent surfaces and areas, to the construction dumpster(s).

F. Cleaning: Clean areas adjacent to the work area of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

2.15 WATER CONTROL

A. The General Contractor shall be responsible for site drainage and snow removal within the limit-of-work lines and shall maintain such drainage and removal during the life of the Contract in a manner approved by the Owner and Architect, and so as not to adversely affect the adjacent areas.

B. Water from the Work of this Project shall be disposed of in such a manner as not to be a threat to public health nor cause damage to public or private property. It shall not be disposed of over surfaces of roads, walks, and streets, nor be permitted to cause any interference with the normal use of the same.

C. Removal of snow and ice from within the limit-of-work lines at the site as required to maintain the continual progress of the work, including that required to keep work areas, access roads, and storage areas clear, free, and in use, and as required to prevent damage to existing construction and new work in places.

2.16 CONSTRUCTION CLEANING AND CONSTRUCTION DUMPSTERS

A. The General Contractor shall provide and pay for temporary dumpster type trash containers outside the building for use by all Subcontractors, and shall have the containers replaced, hauled away, and the contents legally disposed of at sufficient intervals to maintain them at all times in sufficiently empty condition that they are ready to receive trash and debris.

B. All construction dumpsters shall be located in the parking lot within the construction staging area and were permitted by the Owner.

C. Each Contractor on the project shall be responsible for removing their own trash and debris from the building to the construction dumpster(s).

D. Waste materials and rubbish, which might otherwise raise dust, shall be sprinkled during handling and loading to minimize this effect. Debris shall be carried out of the structure in containers or dropped in fully enclosed chutes and shall not be passed through, or thrown from, windows or other wall openings, and in no case shall the debris or trash be permitted to drop freely from the openings.

E. The Work Areas shall be inspected daily and all debris, waste, rubbish, etc. shall be removed and placed in a dumpster.

F. All waste materials and rubbish shall be disposed of legally, off site.

2.17 TEMPORARY RODENT AND PEST CONTROL

A. Rodent and Pest Control: Provide rodent control as necessary to prevent infestation of construction and storage areas. Employ methods and use materials, which will not adversely affect conditions at the site or on adjoining properties. Should rodenticides be considered necessary submit copies of proposed program to Owner and Architect. Use of rodenticide shall comply with manufacturer's published instructions and recommendations. Clearly indicate:

1. Area or areas to be treated.
2. Rodenticides to be used.
3. Manufacturer's printed instructions.
4. Pollution preventive measures to be employed.

2.18 WATCHMEN, FLAGMEN, AND POLICE DETAILS

A. The General Contractor shall provide the services of flagmen, traffic directors, and police details as necessary and as required by authorities having jurisdiction. Please refer to Section 01010 – Summary of Work for additional information regarding the police details and the appropriate pay rates.

2.19 PARKING

A. Parking will be permitted on site or as directed by the owner.

PART 3 - EXECUTION

3.1 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition, until removal. Protect from damage. If damage occurs, repair immediately upon discovery. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour per day basis.

C. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended. Clean and renovate permanent facilities that have been used during construction period, including:

1. Replace air filters and clean inside of ductwork and housings.

2. Replace worn parts.
3. Replace lamps.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made part of this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project.

B. Reference Standards and Definitions: Refer to Section 014200 “References” for the applicability of industry standards to products specified.

C. The Contractor’s Construction Schedule and the Submittal Schedule are specified under Section 013300 “Submittals Procedures”.

D. Administration procedures for handling requests for substitutions made after award of the Contract are specified under Section 012500 “Substitution Procedures”.

1.3 DEFINITIONS

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties", "systems", "structure", "finishes", "accessories", and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material", "equipment", "system", and terms of similar intent.
    a. "Named Products" are items identified by the manufacturer's product name, including make or model number or other designation, shown or listed in the manufacturer's published product literature that is current as of the date of the Contract Documents.
2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.

1.4 SUBMITTALS

A. Product List: Prepare a schedule in tabular form showing each product listed. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate product list with the Contractor's Construction Schedule and the Schedule of Submittals.

2. Form: Prepare product list with information on each item tabulated under the following column headings:
    a. Related Specification Section number.
    b. Generic name used in Contract Documents.
    c. Proprietary name, model number, and similar designations.
    d. Manufacturer's name and address.
    e. Supplier's name and address.
    f. Installer's name and address.
    g. Projected delivery date or time span of delivery period.
    h. Specific Product "Material Safety Data Sheet" reference.
3. Submittal: Within twenty (20) days after date of commencement of the Work, submit four (4) copies of an initial product list. Provide a written explanation for omissions of data and for known variations from Contract requirements.
    a. At the Contractor's option, the initial submittal may be limited to product selections and designations that must be established early in the Contract period.
4. Architect's Action: The Architect will respond in writing to Contractor. No response constitutes no objection to listed manufacturers or products but does not constitute a waiver of the requirement that products comply with Contract Documents. The Architect's response will include the following:
    a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.5 MATERIAL SAFETY DATA SHEETS MANUAL

A. Within ten (10) days after submission of Product List Schedule and before materials may be delivered to jobsite, submit one (1) or more 8 ½ x 11 paper size three (3) ring binder with the Product List Schedule and Material Safety Data Sheet for each product. Using the Product List Schedule as table of contents arrange Materials Safety Data Sheets in table of contents order.

B. Submit one (1) copy of materials Safety Data Sheet Manual to Clerk of the Works and Architect.
    1. Provide one (1) copy of Material Safety Data Sheets for insertion in Manual for products listed on additional Product List Schedules.

C. This requirement is in addition to any obligation the Contractor has to maintain Material Safety Data Sheets at job site or elsewhere.

1.6 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source.
    1. When specified products are available only from sources that do not, or cannot, produce a quantity adequate to complete project requirements in a timely manner, consult with the Architect to determine the most important product qualities before proceeding. Qualities may include attributes, such as visual appearance, strength, durability, or compatibility. When a determination has been made, select products from sources producing products that possess these qualities, to the fullest extent possible.

B. Compatibility of Options: When the Contractor is given the option of selecting between two (2) or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.7 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to the manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.
   1. Schedule delivery to minimize long-term storage at the site.
   2. Coordinate delivery with installation time.
   3. Deliver products to the site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
   4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
   5. Store products at the site in a manner that will facilitate inspection.
   6. Store and maintain products within acceptable environmental ranges and conditions required by manufacturer’s instructions.

1.8 WORK CONDITIONS / SEQUENCE

A. If sub-contractors find that conditions are not appropriate for them to begin the work of their trade or if they are directed to perform their work out of sequence by the General Contractor or if the General Contractor directs sub-contractors to start and continue regardless of job conditions, the sub-contractor shall so notify the Architect in writing by certified mail immediately.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, new at the time of installation.
   1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and the intended use and effect.

B. Product Selection Procedures: Product Selection is governed by the Contract Documents and governing regulations; not by previous project experience. Procedures governing product selection include the following:
   1. Where products or manufacturers are specified by name, accompanied by the term "or equal" or "or approved equal", comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
   2. Non-proprietary Specifications: When Specifications list products or manufacturers that are available and may be incorporated in the Work, they do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

3. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
4. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated. General overall performance of a Product is implied where the product is specified for a specific application.
    a. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.
5. Compliance with Standards, Codes, and Regulations: Where the Specifications only require compliance with an imposed code, standard, or regulation, select a product that complies with the standards, codes, or regulations specified.
6. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.
    a. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product in another product category, or for non-compliance with specified requirements.
7. Visual Selection: Where specified product requirements include the phrase "... as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Architect will select the color, pattern, and texture from the product line selected.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS

A. Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
    1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 01 74 00

WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made part of this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties.

1. Refer to the General Conditions for terms of the Contractor's special warranty on workmanship and materials.

B. General Closeout requirements and procedures are included in Section 017000 "Project Closeout".

1. Specific requirements for warranties on products and installations specified to be warranted are included in the individual Sections of Divisions 2 through 16.
2. Certifications and other commitments and agreements for continuing services to the Owner are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

D. Separate Prime Contracts: Each prime contractor is responsible for warranties related to its own contract.

1.3 DEFINITIONS

A. Standard Product Warranties are pre-printed written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting warranted Work that has failed, remove, and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation, as determined by the Architect.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with the requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selection to products with warranties not in conflict with the requirements of the Contract Documents.

E. The Owner reserves the right to refuse to accept the Work for the Project where a special warranty, certification or similar commitment on the Work or part of the Work is required, until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

1.5 SUBMITTALS

A. Submit written warranties to the Architect bound in the Project Closeout Manual as described in Section 017700 – Closeout Procedures. If the Architect's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within ten (10) days of completion of that designated portion of the Work.

B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties, submit a draft to the Architect, for approval prior to final execution.

C. Prepare a written document utilizing the appropriate form, ready for execution by the Contractor, or by the Contractor and subcontractor, supplier, or manufacturer. Submit a draft to the Architect for approval prior to final execution.

1. Refer to individual Sections of Divisions 2 through 16 for specific content requirements and particular requirements for submitting special warranties.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 WARRANTIES

A. Schedule: Provide warranties on products and installations as specified in the appropriate Sections of the Specification.

1. When products, equipment, or materials fail and/or continue to be a repetitive source of problems, with no satisfactory resolution (e.g., HVAC Equipment) during the warranty period, the Owner reserves the right to extend the period of the initial warranty period. If no satisfactory resolution can be reached during this resolution period, then the Owner reserves the right to demand for the full replacement of the item in question, including all associated work required to execute this replacement at no cost to the Owner.

END OF SECTION

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections are hereby made a part of this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout including, but not limited to, the following:
   1. Inspection procedures.
   2. Contractor's monetized punchlist.
   3. Project Record Document Submittal.
   4. Project Closeout Manual Submittal.
   5. Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request for which the architect shall review and/or approve.
   1. The contractor shall prepare and submit a monetized punchlist. No exceptions will be considered.
   2. In the Application for Payment that coincides with, or first allows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.
      a. If 100 percent completion cannot be shown, the contractor shall provide his monetized punchlist including, but not limited to, the following:
         1) A list of incomplete items.
         2) The value of each incomplete item.
         3) A Reason each item is not complete.
   3. Advise the Owner of pending insurance changeover requirements.
   4. Submit application for reduction of retainage.
   5. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents, as further described below.
   6. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

7. Submit record drawings, maintenance manuals, damage or settlement surveys, and similar final record information, as further described below.
8. Deliver tools, spare parts, extra stock, and similar items.
9. Make final changeover of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of changeover in security provisions.
10. Complete startup testing of systems and instruction of the Owner's operation and maintenance personnel. Discontinue and remove temporary facilities from the site, along with mockups, construction tools, and similar elements.
11. Complete final cleanup requirements, including touch-up painting.
12. Touch-up and otherwise repair and restore, marred, exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
   1. The Architect will repeat inspection when requested and assured that the Work has been substantially completed.
   2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
   1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted.
   2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
   3. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, endorsed, and dated by the Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Architect.
   4. Submit consent to surety of final payment.
   5. Submit a final liquidated damages settlement statement.
   6. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

B. Re-inspection Procedure: The Architect will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Architect.
   1. Upon completion of re-inspection, the Architect will prepare a certificate of final acceptance. If the Work is incomplete, the Architect will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
   2. If necessary, the re-inspection will be repeated.

1.5 RECORD DOCUMENTS

A. General: Maintain a complete set of Record Documents at the site. Do not use Record Documents for construction purposes. Provide access to Record Documents for Architect and Owner's reference. Generally, without limitation, Record Documents shall include the following:

1. Record Drawings: Maintain a clean set of Contract Drawings and shop drawings, updated weekly to show actual installation. Give particular attention to concealed items.
2. Record Project Manual: Maintain a clean Project Manual, including Addenda, Change Orders, Architect Field Orders, and other modifications, updated weekly to show changes in actual work performed. Give particular attention to substitutions, selection of options, and similar information.
3. Record Product Data: Maintain one copy of each approved Product Data submittal, updated weekly to show changes from products delivered, work performed, and from manufacturer's recommended installation instructions.
4. Record Samples: Maintain one copy of each approved Sample submitted.
5. Record Field Test Reports: Maintain one copy of each Field Test Report.
6. Daily Progress Reports: Maintain one copy of each Daily Progress Report.

B. Maintenance of Documents and Samples: Store documents and samples in Contractor's field office apart from documents used for construction. Provide files and racks for document storage. Provide locked cabinet or secure storage space for storage of samples. File documents and samples in accordance with CSI format. Maintain documents in clean, dry, legible condition and in good order. Do not use Record Documents for construction purposes. Make documents and samples available at all times for inspection by Architect.

C. Recording: Label each document "PROJECT RECORD" in neat large, printed letters. Record all information concurrently with the progress of construction. Do not conceal any work until required information is recorded.

D. Drawings: Legibly update all Drawings to record actual construction, including the following:

1. Field changes of dimension and detail.
2. Changes made by Field Order or Change Order.
3. Details not in original Contract Documents.

E. Specifications and Addenda: Legibly mark each Section to record:

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment installed.
2. Changes made by Field Order or by Change Order.

F. Submittal: At Contract Closeout, deliver Record Documents to Architect. Accompany submittal with transmittal letter in duplicate, indicating the date, Project title and number, Contractor's name and address, title and number of Record Document, and signature of Contractor or his authorized representative.

1.6 PROJECT CLOSEOUT MANUAL

A. General: Prepare and submit Project Closeout Manual as specified in this Section and as approved by the Architect for format. Organize data into suitable sets, bound and indexed using the specification's Table of Contents as a guide. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Contact Persons' Names
2. Telephone Numbers
3. Pager or Beeper Numbers
4. Cellular Phone Numbers
5. Description of each warranty item covered.
6. Instructions Describing Protocol for Requesting Warranty Service.
7. Emergency Numbers – 911, Fire, Rescue, Police.
8. Utility Company Contacts.

B. Instruct Owner's personnel in use and layout of manual.

C. Format of Data: Prepare data in form of user's guide-type manual for use by Owner's personnel. Format shall be 8-1/2 in. x 11 in., 20-pound minimum, white, typed pages. Text shall be printed or neatly typewritten. Drawings shall be bound with text, with reinforced punched binder tabs. Fold larger drawings to the size of text pages. Provide flyleaf for each separate section. Provide typed descriptions of each product and piece of major equipment. Provide indexed tabs to divide sections. Provide reference in each section to other binders for actual Operating and Maintenance Data. Coordinate Project Closeout Manual with Operating and Maintenance Data.

1. Binders: Provide commercial quality three-ring binders with durable and cleanable plastic covers, with maximum ring size of three (3) inches. Only use one (1) binder for this manual.
2. Binder Cover: Identify each volume with typed or printed title "PROJECT CLOSEOUT MANUAL". List title of Project, identity of separate structure as applicable, and identity of general subject matter covered in the manual.

D. Submittal of Project Closeout Manual: Submit two copies of preliminary draft of proposed formats and outlines of contents prior to start of Work.

1. Architect will review draft and return one copy with comments.
2. Submit one copy of complete data in final form 15 days prior to final inspection or acceptance. Copy will be returned after final inspection or acceptance, with comments.
3. Submit three copies of approved data in final form ten days after final inspection or acceptance.

1.7 OPERATING AND MAINTENANCE DATA

A. General: Prepare and submit Operating and Maintenance Data as specified in this Section and referenced in other pertinent Sections of Specifications. Organize Operating and Maintenance Data into suitable sets, bound and indexed. Mark appropriate identification on front and spine of each binder. Include the following types of information:

1. Emergency instructions.
2. Spare parts list.
3. Copies of warranties.

4. Wiring diagrams.
5. Inspection procedures.

B. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.

C. Preparation of data shall be done by personnel trained and experienced in maintenance and operation of described products.

D. Format of Data: Prepare data in form of instructional manual for use by Owner's personnel. Format shall be 8-1/2 in. x 11 in., 20-pound minimum, white, typed pages. Text shall be manufacturer's printed data, or neatly typewritten. Drawings shall be bound with text, with reinforced punched binder tabs. Fold larger drawings to the size of text pages. Provide flyleaf for each separate product or each piece of operating equipment. Provide typed description of product and major component parts of equipment. Provide indexed tabs.

1. Binders: Provide commercial quality three-ring binders with durable and cleanable plastic covers, with maximum ring size of two (2) inches. When multiple binders are used, correlate the data into related consistent groupings.
2. Binder Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List title of Project, identity of separate structure as applicable, and identity of general subject matter covered in the manual.

E. Content of Manual: Neatly typewritten table of contents for each volume, arranged in systematic order, indicating Contractor name and address, and a list of each product, indexed to content of the volume. Provide a separate list with each product, name, address, and telephone number of subcontractor or installer, and local source of supply for parts and replacement.

1. Provide in each volume a copy of each warranty, bond, and service contract issued.

F. Submittal of Maintenance and Operating Manual: Submit two copies of preliminary draft of proposed formats and outlines of contents prior to start of Work.

1. The Architect will review draft and return one copy with comments.
2. Submit one copy of complete data in final form 15 days prior to final inspection or acceptance. Copy will be returned after final inspection or acceptance, with comments.
3. Submit three copies of approved data in final form ten days after final inspection or acceptance.

1.8 INSTRUCTION OF OWNER'S PERSONNEL

A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in the operation, adjustment and maintenance of products, equipment, and systems.

B. Operating and maintenance manual shall constitute the basis of instruction.

1. Review contents of manual with personnel in full detail to explain all aspects of operation and maintenance.

1.9 WARRANTIES AND BONDS

A. General: Assemble warranties, bonds, and service and maintenance contracts, executed by each of the respective manufacturers, suppliers, and subcontractors into the Project Closeout Manual.

B. Refer to Section 017400 – Warranties and Bonds for additional requirements.

1.10 FINAL CLEANING

A. General: General cleaning during construction operations is specified as Work of Section 015000 – Temporary Facilities & Controls.

B. Employ experienced workers or professional cleaners for Final Cleaning. Clean each surface to the condition expected in a normal building cleaning and maintenance program. Comply with manufacturer's instructions and recommendations.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

A. General: Provide cleaning materials that will not create hazards to health or property and will not damage surfaces or finishes.

B. Use cleaning materials and methods recommended by the manufacturer of surface to be cleaned.

C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. Employ skilled workers for final cleaning.

B. Clean and restore general work areas and adjoining surfaces and other work soiled or damaged during installation; replace work damaged beyond successful restoration. Where performance of subsequent work could result in damage to the complete unit or element, provide protective covering and other provisions to minimize potential for damage.

C. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed interior and exterior surfaces.

D. Special Cleaning for Windows: New glass installed as part of this project shall be thoroughly cleaned inside and out by professional window cleaners at the conclusion of all other work and prior substantial completion. All damaged, broken, or scratched items shall be replaced without costs to Owner, as described under the appropriate Trade Section(s).

E. Complete the following cleaning operations prior to requesting inspection for Certification of Substantial Completion:

1. Concrete and masonry shall be cleaned free of all foreign matter. If, in the opinion of the Architect, further cleaning of specific areas is required they shall be scrubbed with water or other cleaning agents. Acid cleaners shall not be used, except as may otherwise specifically be permitted in the trade sections.
2. Metal surfaces, hardware, fixtures, appliances, equipment, and similar items shall be cleaned free of all foreign matter and, if necessary, shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags, thoroughly rinsed and wiped with clean, soft white rags. Abrasive cleaners shall not be used.
3. Architectural woodwork shall be thoroughly dusted and cleaned of all stains, spots, etc., using methods and cleaning agents, which will not damage the various finishes.
4. Ceramic tile, porcelain, and other surfaces with integral finishes, shall be washed with clean water, mild soap, and soft rags, thoroughly rinsed, and then wiped with clean, soft white rags. Abrasive cleaners shall not be used.
5. Resilient flooring shall be given final cleaning and buffing.
6. Carpeting shall be vacuum cleaned and shall have all spots and stains removed.
7. Painted surfaces shall be cleaned free of all foreign matter, and if necessary, shall be lightly scrubbed at specific stains with clean water, mild soap, and soft rags, thoroughly rinsed, and wiped with clean, soft white rags.
8. All advertising matter and temporary instructional material shall be removed from exposed surfaces throughout.
9. Remove labels that are not permanent.
10. Clean interior and exterior finishes to a clean, dust-free condition. Remove stains, films, and similar foreign substances.
11. Vacuum and mop hard floor surfaces.
12. Clean plumbing fixtures to a sanitary condition.
13. Clean site areas of rubbish, litter, and other foreign substances.
14. Sweep paved areas broom clean, rake ground surfaces clean.

F. Before final completion and Owner-occupancy, inspect sight-exposed interior and exterior surfaces and work areas to verify that Work is clean.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Provide all labor, materials, equipment, services and accessories necessary to furnish and install the work of this Section, complete and functional, as indicated in the Contract Documents and as specified herein. Steel sections indicated on the Architectural Drawings but not indicated on the Structural Drawings shall be made part of Section Metal Fabrications.

B. The work of this Section consists of furnishing and erecting all structural steel work as shown on the Drawings and as specified herein or both. Structural steel work is that work defined in AISC "Code of Standard Practice" plus the steel work listed below and shown on the Structural Drawings, which includes, but is not limited to, the following:

1. Base plates and bearing plates if shop attached to structural steel columns or beams.
2. Fasteners and connecting materials for framing structural steel to structural steel (i.e., shop and field bolted and/or welded connections of columns, base plates, tubes, beams, hangers, etc.)
3. Selection of bolted/welded structural connections, as indicated on the Drawings, in accordance with AISC.
4. Columns, beams, girders, purlins, girts, posts, channels, angles, plates, frames, anchors, rods, hangers, etc.
5. Galvanizing of all exposed exterior elements, unless otherwise noted, and any other steel indicated on the drawings.
6. Temporary connections, shoring and bracing, as required.
7. Stiffener plates, where indicated.
8. Chemical adhesive anchors and expansion anchors.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:

1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein.
2. Section 23 00 00 - Mechanical
3. Section 26 00 00 – Electrical

1.3 REFERENCE SPECIFICATIONS

A. "Code of Standard Practice for Steel Buildings and Bridges," and "Specifications for Structural Steel Buildings, Allowable Stress Design and Plastic Design", Seismic Provisions for Structural Steel Buildings", by the American Institute of Steel Construction, latest edition.

B. "Code for Welding in Building Construction" by the American Welding Society".

C. ASTM listed standards by the American Society for Testing and Materials.

D. In case of conflict between the Reference Specification and the Project Specification, the Project Specification shall govern. In case of conflict between Reference Specifications, the more stringent shall govern.

E. When compliance with any Specification is specified herein for materials (or a product, manufactured or fabricated), the Contractor, if requested shall furnish an affidavit from the manufacturer (or fabricator) certifying that the materials (or product) delivered to the job meets the requirements specified. However, such certification shall not relieve the Contractor from the responsibility of complying with any added requirements specified herein.

1.4 SUBMITTALS

A. Submit complete Shop Drawings in accordance with the provisions of Section 013000 – SUBMITTAL.
1. No variance from design sizes and details will be permitted on submitted Shop Drawings, but requests for modification of connections of details to better suit their shop practice, or for any other reasons, will be considered by the Architect.
2. Fabrication of any material or performing of any work prior to the final review of the Shop Drawings will be entirely at the risk of the Contractor.
3. Shop Drawings shall include all information necessary for fabrication of the component parts of the structure. They shall indicate size and weight of members - type and location of shop and field connections, the type, size and extent of all welds, and the welding sequence when required. The welding symbols used on the Shop Drawings shall be as adopted by the American Welding Society.
4. Review of Shop Drawings shall be for size and arrangement of principle and auxiliary members and strength of representative connections based on sample checks. Any errors in dimensions shown on Shop Drawings shall be the responsibility of the Contractor.
5. Prior to the submission of structural steel shop drawings, all dimensions pertaining to existing conditions (particularly at existing concrete pier / pedestals) shall be field-verified by the contractor.

1.5 TESTING AND INSPECTION

A. All materials and workmanship under this Section shall be subject to inspection in the mill, shop or field by qualified inspectors paid directly by the Owner. Structural Tests and Inspections shall be in accordance with Chapter 17 of the International Building Code.

B. However, such inspection, wherever conducted, shall not relieve Contractor of his responsibility to furnish materials and workmanship in accordance with Contract requirements, nor shall inspector's acceptance of materials or workmanship prevent later rejection of same by the Owner or Architect if defects are discovered.

C. Inspection of welding work shall consist of non-destructive spot testing done by magnetic, magnetic particle or ultrasonic method, whichever is most effective for joint to be tested.

D. Inspection of bolting work shall be in accordance with "Specification for Structural Joints Using ASTM A325 or A490 Bolts" by the American Institute of Steel Construction.

E. The Contractor shall give proper notice to inspection agencies approved by the Architect and shall allow access and full facilities as required for this inspection.

F. Regardless of any testing done, the Contractor is responsible for completing the structural steel work in complete compliance with these Specifications.

G. The Contractor must set up a quality control program in the shop and in the field to ensure compliance with the Specifications.

H. Report in writing to the Architect the results of the Contractor's inspection.

I. When the Contractor is satisfied that the work has been satisfactorily completed, notify the Architect, who will make arrangements with the independent testing engineer retained and paid by the Owner to verify that the work complies with these Specifications.

1.6 STORAGE AND HANDLING

A. Care and protection shall be given to all structural steel during handling and storage. If items are to be stored prior to installation, they shall not be placed in contact with the ground and they shall be protected from the elements and kept dry.

B. Do not store materials on the structure in a manner that may cause distortion or damage to supporting structural elements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Unless otherwise noted, structural steel wide flanged shapes shall conform to ASTM A992, Grade 50. Unless otherwise noted, steel channels, plates, and angles shall be in accordance with the requirements of ASTM A36.

B. Bolts, nuts and washers shall comply with the requirements of ASTM, F3125, A325 or A490 Bolts. Bolts shall be A325N with washer. Connections shall be bearing type with shear planes through threads.

C. Weld and joint details shall comply with the requirements of the "Code for Welding in Building Construction" by the American Welding Society.

D. Chemical adhesive anchors shall be HIT-HY200 V3 Safe Set System by Hilti or equal reviewed by the Architect.

The Contractor may submit alternative connector devices for review of the Architect. Alternative devices shall satisfy all applicable spacing and edge conditions and shall provide a connection of at least the strength of the connection required on the Contract Documents. Submission for alternative designs should be accompanied by complete engineering calculations certified by a Professional Engineer licensed in Massachusetts.

2.2 FABRICATION

A. All structural steel shall be fabricated in accordance with Reference Specifications, approved Shop Drawings, and as hereinafter specified.

B. The selection of members and connections for any portions of the structure not indicated on the Drawings shall be completed by the fabricator. Connections shall be capable of supporting the maximum reactions given in typical detail noted on the drawings for the specific beam size.

C. All shop connections shall be welded or bolted.

D. All field connections shall be bolted unless otherwise indicated on the Drawings.

E. Unless otherwise noted, diameter of holes in bolted parts shall be 1/16" greater than the nominal diameter of the bolt. No unfair holes will be accepted, and enlargement of holes shall not be accomplished by burning. Burrs resulting from drilling or punching shall be ground to the surface of the material. Shearing and punching shall be done cleanly so as not to deform or mar adjacent surfaces.

F. Provide holes and connections as required for site assembly of steel work. Holes shall be drilled or punched and reamed in the shop. Show sizes and locations of all such holes on the Shop Drawings.

G. Corrective work for structural steel members or assemblages having fabrication errors, or which exceed permissible tolerances shall be corrected only if permitted by the Architect. All corrective work shall be in accordance with AISC and AWS requirements. When requested by the Architect or testing agency, the Contractor shall submit to the Architect, for approval, drawings showing details of proposed corrective work and shall receive reviewed drawings prior to performing the corrective work. All corrective work shall be solely at Contractor's expense.

H. All structural steel members shall have assigned positions and an identification mark or symbol, plainly indicated thereon near one end. Marks shall agree with those given on the shop drawings and erection drawings relating to or calling for the member.

2.3 PROTECTIVE COATINGS

A. All structural steel surfaces including connections shall receive SSPC-SP6, “Commercial Blast Cleaning”.

B. Refer to Architectural Drawings for exposed steel elements requiring finish painting.

C. Hot Dip Galvanizing: Items exposed to the exterior or indicated on the drawings shall be hot- dipped galvanized after fabrication. Galvanizing bath shall be a combination nickel-zinc mixture. Prior to galvanizing, the steel shall be immersed in a pre flux solution of zinc ammonium chloride. The use of the wet kettle process shall be prohibited. Galvanize all ferrous fasteners, clips, sleeves, anchors and accessories in contact with galvanized items.
1. Galvanizing shall comply with ASTM A123, A153 or A386 as applicable.
2. Items to be galvanized shall be galvanized after fabrication. Where the size of assembly is too large for complete unit galvanizing, these assemblies shall be galvanized prior to fabrication, in as large sections as practical and then only with the written approval of the Architect.
3. Where galvanizing prior to completing fabrication cannot be avoided, joints shall be welded after fabrication, ground smooth and finished with four (4) full coats of California Products Corp. WW Totrust, Sealube ZRC, Zirp by Duncan or equal.

D. Shop Coating of Hot Dip Galvanized Steel:
1. Shop priming of galvanized steel: Where hot dip galvanized steel is to be primed prior to receiving a shop or field applied topcoat, it shall be primed by the galvanizer within twelve hours of galvanizing. The primer shall be a polyamide epoxy applied to a minimum D.F.T. of 2.5 mils and force cured in a facility capable of maintaining 130 degrees F.
2. Shop painting of galvanized steel: Where hot dip galvanized steel is to receive a factory applied topcoat, it shall first be primed as stated above and shall then be coated by the galvanizer in a dedicated coating facility. The factory-applied topcoat shall be an aliphatic polyurethane applied to a D.F.T. of 2-4 mils and force cured in a facility capable of maintaining 130 degrees F. The galvanizer shall assume sole source responsibility for the coating system.

PART 3 - EXECUTION

3.1 ERECTION

A. All structural steel shall be anchored and erected in accordance with Reference Specifications, approved Shop Drawings, and as hereinafter specified.

B. All work shall be accurately set to established lines and elevations and rigidly fastened in place with suitable attachments to the construction of the building. Errors in shop fabrication or deformation resulting from handling and transportation shall be reported immediately to the Architect, and approval of the method of erection shall be obtained. Approved corrections shall be made at no additional cost to the Owner.

C. Temporary bracing, guying, and support shall be provided to keep the structure safe and aligned at all times during construction, and to prevent danger to persons and property. Check all temporary loads and stay within safe capacity of all building components. All work shall be in conformance with AISC, "Code of Standard Practice", Latest Edition.

D. Except as otherwise indicated, all field connections shall be bolted in accordance with the AISC "Specifications for Structural Joints using ASTM A325 Bolts". Except as otherwise indicated, bolts shall be bearing type and need only be tightened to the snug tight condition as defined in Section 8.c of the bolt specification.

E. Do not cut or alter any member in the field without Architect's written review for each specific condition.

F. All welding shall be in accordance with Referenced Specifications and shall be done only by experienced welders who have, within one (1) year previously, been qualified by tests as prescribed in AWS "Standard Qualifications Procedure" for the type of work required.

G. Galvanized elements shall be touched up (brush only) with 4 mils minimum of a zinc-rich paint at areas scarred by bolting or welding.

H. Installation of injection adhesive anchors shall be in accordance with the manufacturer's requirements. Embedment of anchors into concrete shall be as specified on the Drawings but shall not be less than required by the manufacturer or the following (whichever is more stringent):

3/8"	anchor diameter	3 ½" minimum embedment
½"	anchor diameter	4 ¼" minimum embedment
5/8"	anchor diameter	5" minimum embedment
¾"	anchor diameter	6 ¾" minimum embedment
7/8"	anchor diameter	7" minimum embedment
1"	anchor diameter	8 ¼" minimum embedment

I. Camber steel beams and girders as specified on the drawings.

J. All leveling or bearing plates shall be set level to correct elevations and the entire bearing area under the leveling plate shall be grouted solid with an approved non-shrink grout.

END OF SECTION

SECTION 07 62 00

ROOF FLASHING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK

A. The Work of this Section shall include, but not be limited to, furnishing and installation of the following:

1. EPDM membrane flashing
2. Sheet metal flashing.
3. All receivers, clips, cleats, and trim are required for complete installation.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Carefully examine all the Contract Documents for requirements which affect the Work of this Section.

B. Other Specification Sections which directly relate to the Work of this Section include, but are not limited to, the following:

1. DIVISION 01 – GENERAL REQUIREMENTS; including all Sections contained therein.
2. Section 23 00 00 - HVAC
3. Section 26 00 00 - Electrical

1.04 SUBMITTALS

A. Provide submittals in accordance with requirements of Section 01 33 00 – Submittal Procedures and in accordance with requirements of the Contract Documents.

B. Submit manufacturer’s product data for each product indicated.

C. Submit large scale shop drawings, including layouts, profiles, shapes, seams, dimensions, and details for fastening, joining, supporting, and anchoring sheet metal flashing and trim.

D. Submit 12 in. square, or 12 in. long samples for each type of roof flashing and trimming.

1.05 QUALITY ASSURANCE

A. The Work of this Section shall comply with the requirements of SMACNA's "Architectural Sheet Metal Manual" and conform to dimensions and profiles shown unless more stringent requirements are indicated.

1.06 PRE-INSTALLATION MEETING

A. The General Contractor shall schedule a pre-installation meeting to establish compliance and expectation of Work, maintain optimum working conditions, determine acceptable mock-ups, and coordinate the Work of this Section with related and adjacent Work. The meeting shall be attended by the General Contractor, Architect, and related subcontractors.

PART 2 - PRODUCTS

2.01 EPDM MEMBRANE FLASHING

A. Provide EPDM flashing membrane, Sure-Seal/Sure-White Pressure-Sensitive Pourable Sealer Pocket: Prefabricated Pourable Sealer Pocket consisting of a 2 inch (51 mm) wide plastic support strip with Pressure-Sensitive, Factory-Applied, adhesive backed uncured Elastoform Flashing.

B. Accessories:

1. Carlisle Weathered Membrane Cleaner: Clear, solvent-based cleaner used to loosen and remove contaminants from the surface of exposed EPDM membrane prior to applying EPDM Primer.
2. Sure-Seal SecurTAPE: 3 inch (76 mm) or 6 inch (152 mm) wide by 100 foot (30.5 M) long splice tape used for splicing adjoining sections of EPDM membrane.
3. Sure-White SecurTAPE: A 3 inch (76 mm) or 6 in. wide (152 mm) wide by 100 foot (30.5 M) long, white colored splice tape used with Sure-White Systems.
4. Sure-Seal HP-250 Primer: A solvent-based primer used to prepare the surface of EPDM membrane for application of Splice Tape or Pressure-Sensitive products.
5. Low VOC EPDM and TPO Primer - A low VOC (volatile organic compound) primer (less than 250 grams/liter) for use with SecurTAPE or Pressure-Sensitive products.
6. Sure-Seal/Sure-White Splicing Cement: A high-strength, butyl-based contact cement which is used for splicing adjoining sections of EPDM membrane (cured or uncured).
    a. Sure-Seal Splicing Cement: Black splicing cement for use with Sure-Seal (black) Roofing Systems.
    b. Sure-White Splicing Cement: White splicing cement used with Sure-White (white-on-black) Adhered Roofing Systems.
7. Sure-Seal/Sure-White Lap Sealant: A heavy-bodied material (trowel or gun-consistency) used to seal the exposed edges of a membrane splice.
    a. Sure-Seal Lap Sealant: Black sealant for use with Sure-Seal (black) Roofing Systems.
    b. Sure-White Lap Sealant: White sealant for use with Sure-White (white-on-black) Roofing Systems.

2.02 SHEET METAL FLASHING

A. Provide Type 304 stainless steel cap flashing, counterflashing, and related accessories and fasteners shall be in sizes and configurations as indicated on the Drawings.

B. Accessories:

1. Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items required for complete sheet metal flashing and trim installation.
2. Fasteners, including wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners shall be designed and installed to withstand specified design loads.
3. Butyl sealant shall comply with requirements of ASTM C 1311 for single-component, solvent-release butyl rubber sealant, polyisobutylene plasticized, heavy bodied for hooked-type expansion joints with limited movement.
4. Bituminous coating shall be cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat.

PART 3 - EXECUTION

3.01 PREPARATION

A. All surfaces must be clean, sound, dry, and free of loose materials and laitance, or contaminants such as water, frost, ice, oil and grease that would interfere with proper adhesion and compromise the performance of the product.

3.02 MEMBRANE FLASHING INSTALLATION

A. Membrane flashing is installed after proper preparation of the approved substrate. The flashing membrane is unrolled and cut to length. Position the flashing membrane with the 6" (152 mm) selvage edge overlapping the field roof membrane to accommodate heat welding of the overlap. Remove the release liner from the flashing membrane in a smooth, wrinkle-free manner while maintaining the 6" (152 mm) overlap onto the field roof membrane. Immediately roll the flashing membrane with a hand roller.

3.03 METAL FLASHING INSTALLATION

A. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items necessary and required to complete sheet metal flashing and trim system.

1. Torch cutting of sheet metal flashing and trim is not permitted.
2. Saw cut existing masonry a minimum of 1 inch in depth or as otherwise required for installation of new base flashing and counter flashing.
3. Install new counter flashing in a continuous manner, anchored with lead wedges at 8 inches on center, minimum, overlapped and sealed in accordance with the Contract Documents.

B. Where dissimilar metals shall contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and butyl sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

1. Space cleats not more than 12 inches apart. Enclose each cleat with two fasteners. Bend tabs over fasteners.

F. Seal joints with butyl sealant in a professional workmanlike manner to produce a clean, tight watertight construction.

G. Clean surfaces to be soldered, removing oils and foreign matter. Pre-tinned edges of sheets to be soldered to a width of 1-1/2 inches except where pre-tinned surface would show in finished Work. Pre-tinning is not required for lead-coated copper.

H. Provide non-pressure treated blocking and plywood at all locations in accordance with the approved manufacturers written requirements.

I. Refer to the Drawings for all conditions necessary to complete the Work. In the absence of drawing details, blocking, and sheathing shall be provided in accordance with the approved flashing or pre-manufactured manufacturer's written installation details, or as otherwise required to accommodate field conditions approved by the Architect.

3.04 RUBBISH REMOVAL

A. The General Contractor shall remove and dispose daily of all waste and debris in accordance with the requirements of Section 01 50 00 – Temporary Facilities and Controls.

END OF SECTION

SECTION 23 00 00

HVAC

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 General Requirements, apply to the work of this section. Where paragraphs of this Section conflict, the more stringent requirements shall govern.

B. Division 23 00 00 contractor shall be considered the “prime contractor” for this project. This contractor shall be responsible for providing all labor and materials necessary to provide a fully functional and complete system including related work such as electrical, wall and ceiling repair, coring, structural & supplemental steel, cutting & patching, roofing patching and flashing and related work, finish work & painting, etc... Contractor shall hire properly licensed and qualified subcontractors to perform work outside their scope of their expertise such as but not limited to licensed electricians for electrical work and licensed general contractors for painting, framing, cutting and patching.

C. All work shall comply with all federal, state and local codes and any other authorities having jurisdiction.

1.02 SUMMARY OF WORK

A. Provide all materials, labor and equipment required to perform the work of this section, as shown on the Contract Drawings and as specified herein, to include the following. When the word “provide” is used in this specification it shall mean to furnish & install. Provide the following:

1. Disconnect, drain and pump down refrigerant in existing chiller and abandon chiller in place for future removal. Disconnect and drain existing cooling tower and abandon in place for future removal. Perform selective demolition of existing condenser water and chilled water piping as reflected on the drawings. Perform selective demolition of power and controls to existing chiller, tower and pumps made abandoned by this project.
2. Rig and install packaged air-cooled chiller furnished by Owner’s rental company vendor.
3. Piping and all related hydronic accessories to connect new chiller to existing chilled water system as shown on the drawings.
4. Extend existing 2” plumbing vent and run thru roof. (by licensed plumber)
5. Insulation for piping.
6. Automatic temperature controls.
7. Motor starters and drives.
8. Instruction manuals and startup instructions.
9. Testing and balancing.
10. Glycol, glycol feeder and associated water treatment.
11. Equipment bases and supports and pads.
12. Seismic restraint and vibration isolation.
13. All rigging and hoisting of equipment as required.
14. Coring of all holes and firestopping.
15. Prefabricated or field erected curbs.

16. All electrical power and control wiring and devices (refer to 26 00 00).

B. Related Work Specified Under Other Divisions

1. As this contractor is prime all Division Sections are made part of this section.
2. Division 1 – General Requirements; including all Sections contained herein
3. Electrical (refer to 26 00 00)
4. Structural Steel (refer to 05 12 00)

C. The HVAC Subcontractor is responsible for sleeving the slab and walls for all of their required work. The HVAC Subcontractor shall be responsible for all coring of their work. All penetrations through the structure shall be sealed air and watertight or where penetrating a fire rated element must be firestopped. All penetrations of the floors and ceiling shall be firestopped.

D. Provide seismic bracing as required by the Commonwealth of Massachusetts building code 780 CMR, 9th edition, Chapter 16. HVAC Subcontractor shall hire a seismic consultant to comply with requirements of the code. HVAC Subcontractor to note that all equipment must be seismically restrained regardless of code exception.

E. Reference To Drawings: Work specified is shown on the Mechanical and electrical drawings.

1. The HVAC Subcontractor shall refer to all the Drawings enumerated in the List of Drawings on the title sheet for a full comprehension of the work to be done and for conditions affecting the location and placement of his equipment and materials. These Drawings are intended to be supplementary to the Specifications and any work indicated, mentioned, or implied in either is to be considered as specified by both. Should the character of the work herein contemplated or any matter pertaining thereto be not sufficiently explained in the Specifications or Drawings, the HVAC Subcontractor may apply to the Architect-Engineer for further information and shall conform to such when given, as it may be consistent with the original intent. The Architect-Engineer reserves the right to make any reasonable changes in location prior to installation at no expense to the Owner. All lines are diagrammatic and exact locations are subject to the approval of the Architect-Engineer.

2. The HVAC Subcontractor shall, at all times, have a foreman or superintendent on the project authorized to make decisions and receive instructions as if the HVAC Subcontractor himself were present. The foreman or superintendent shall not be removed or replaced without the express approval of the Architect-Engineer after construction work begins. The HVAC Subcontractor shall employ only competent and experienced workmen at a regular schedule in harmony with the other tradesmen on the job. The HVAC Subcontractor shall also exercise care and supervision of his employees in regard to proper and expeditious layout of his work.

F. Chiller must be fully operational and project substantially complete no later than July 14, 2023 however, contractor shall endeavor to install chiller and make operational as quickly as possible due to the need for cooling.

G. It shall be the HVAC subcontractors responsibility to coordinate the training, factory start-ups and instruction outlined in division 23 00 00 and the Testing and Balancing

requirements. The chiller rental company shall provide factory start-up authorized representatives to start the chiller. Coordinate with all other disciplines for the start-up.

1.03 SUBMITTALS

A. Refer to Division 1 for additional submittal provisions and procedures.

B. Product data: within 15 calendar days after the HVAC Subcontractor has received the Owner's Notice to Proceed, submit one (1) PDF copy of the following:

1. Coordinated shop drawings, showing proposed layout of equipment, piping, controls and other components of the system. All heights, transitions, dimensions, etc… shall be clearly shown. Note that a color printed hard copy of the coordination drawings is required for review.
2. Manufacturers catalog cuts, Samples and other items needed to fully demonstrate the quality of the proposed materials and equipment. In addition to the submittals formerly mention herein submit equipment specification sheets and dimensional data on all equipment including but not limited to the following:
   - Piping and all related hydronic accessories.
   - Insulation for piping.
   - Motor starters and drives.
   - Instruction manuals and startup instructions.
   - Testing and balancing.
   - Glycol, glycol feeders and associated water treatment.
   - Seismic restraints and vibration isolation.
   - Supplemental steel.
   - Automatic Temperature Controls

B. Record Drawings

1. Include a copy of the Record Drawings in each copy of the operation and maintenance manual described below. A reproducible set of as-built drawings shall be updated continually through the project and delivered to the Engineer at project completion. Record drawings shall also be delivered in both ACAD format and PDF format on a flash drive.

C. Shop Drawings

1. Detail at ¼ scale the piping layout, fabrication of pipe anchors, hangers, supports for multiple pipes, alignment guides, expansion joints and loops, and attachments of the same to the building structure. Detail location of anchors, alignment guides and expansion joints and loops.
2. Grooved joint couplings and fittings shall be shown on the drawings and product submittals, and be specifically identified with the applicable style or series number.

D. Testing and Balancing Reports

1. Submit one PDF copy of the certified testing and balancing report to the Engineer for review and approval. Include all air flow, water flow and temperature readings as outlined herein.

D. Operating Instructions

A. Prior to the completion of all work and the final inspection of the installation by the owner, two (2) copies of a complete Instruction Manual, bound in booklet form and suitably indexed, shall be submitted to the Engineer for review and approval. All written material contained in the manual shall be typewritten. In addition, provide a copy of the manual in an index PDF format on a flash drive.

1.04 INSTRUCTION OF OWNER'S PERSONNEL

A. After completion of all work and all tests and at such time as designated by the owner, provide the necessary skilled personnel to operate the entire installation for a period of eight (8) hours. Training shall be broken up into multiple four (4) hour periods at the direction of the Owner.

B. During the operating period, fully instruct the owner's representative in the complete operation, adjustment and maintenance of the entire installation.

C. It shall be the HVAC subcontractors responsibility to coordinate the training, factory start-ups and instruction outlined in division 23 00 00 and the Testing and Balancing requirements. Factory start-up by authorized representatives are required for all equipment

1.05 PERMITS, FEES, RULES AND REGULATIONS

A. Contractor shall pay for and acquire all permits required of the work of this contract. For all hot work inside or on the building structure the contractor shall pay the local fire department for fire watch details.

B. Give the proper Authorities all requisite notices or information relating to the work under this Section. Obtain and pay for all fees, licenses, permits and certificates. Comply with the rules and regulations of all Local, State and Federal Authorities having jurisdiction, the Codes, Standards, recommended practices and manuals of the National Fire Protection Association, I.S.O., and the Public Utilities Companies serving the building.

1.06 MECHANICAL AND ELECTRICAL COORDINATION DRAWINGS

A. The prime HVAC contractor shall be responsible for generating base coordination drawings for the project coordinating with all other trades. Hard copies of the coordination drawings are required for this project.

1.07 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. The HVAC Subcontractor's superintendent shall conduct all coordination between the General Contractor, the Engineers, etc., and shall fully represent the HVAC Subcontractor's position in his absence. All decisions by the superintendent shall become the responsibility of the HVAC Subcontractor and binding to the Contract. The HVAC Subcontractor shall be responsible for the drawings, and that which is written or implied in the specifications.

C. Without additional cost to the Owner, provide such other labor and materials as are required to complete the work of this Section in accordance with the requirements of governmental agencies having jurisdiction, regardless of whether such materials and associated labor are called for elsewhere in these Contract Documents.

D. Before submitting the final proposal examine the site of the proposed work to determine existing conditions that may effect the work, as this section will be help responsible for any assumption in regard thereto.

E. All equipment, ductwork, piping and materials utilized for this project must be protected from exposure to weather until installed. Interior equipment and materials shall not be installed unless the area in which they are being installed is adequately weather tight.

F. Condensate evaporation trays are expressly forbidden on all HVAC equipment.

G. To assure uniformity and compatibility of piping components in grooved end piping systems, all grooved products utilized shall be supplied be a single manufacturer. Grooving tools shall be supplied by the same manufacturer as the grooved components.

1.08 GUARANTEE

A. The HVAC Subcontractor shall guarantee every component part of each system for a minimum of one-year parts and labor from the date of substantial completion. The HVAC Subcontractor shall also provide the Owner with factory warranties for all equipment. The rental company shall be responsible for the warranty on the chiller itself.

PART 2 - PRODUCTS

2.01 PIPING MATERIALS – GENERAL

A. Reference is made to specifications of recognized authorities to establish quality. Latest edition of their publications at time of bidding shall be in force.

B. All piping shall have manufacturer's name or trade mark rolled into each and every length of pipe.

C. All threads for screwed joints shall be National Taper Pipe Thread conforming to ANSI B2.1.

D. Grooved mechanical joint pipe, fittings and couplings shall be allowed as an acceptable substitution for welded, threaded or flanged pipe fittings except as otherwise not allowed by applicable codes. Product shall be as manufactured by Victaulic Company of America, Grinnell Mechanical Products, Anvil International Gruvlok or an Engineer approved equal. Fittings shall comply with ASTM A536 with grooves or shoulders to accept grooved end couplings. Mechanical couplings shall consist of ductile iron housing, synthetic rubber gasket of a central cavity pressure-responsive design, nuts, bolts, locking pin, locking toggle, or lugs to secure grooved pipe and fittings.

1. Rigid type: Housings (12" and smaller) shall be cast with offsetting, angle-pattern bolt pads or tongue and groove design to provide system rigidity and support and hanging in accordance with ASME B31.1 and B31.9..Only designs that require metal-to-metal pad contact permitted. Designs that permit spaces or gaps at bolt pads or require a torque

as a primary means of ensuring joint rigidity per written manfuacturer's instructions are not permitted. Victaulic Style 107H, Style 07 or W07 or Gruvlok Style 7401, Style 7402, Style 7400.

2. Flexible Type: Use in locations where vibration attenuation and stress relief are required. Victaulic Style 177, 77 and W77 or Anvil International Gruvlok Style 7001.. Three (3) flexible couplings may be used in lieu of each flexible connector at major equipment in accordance with published guidelines.
3. Flange Adapters: Ductile iron housing, flat face, for use with grooved end pipe and fittings, for mating directly with ANSI Class 125, 150, and 300 flanges. Victaulic Style 741, W741 or 743 or Anvil International Gruvlok Style 7012, 7013 or 7788.

E. Copper Hydronic Pipe Mechanical Fittings by Viega ProPress or approved equal by Elkhart or Nibco: Bronze or copper shall conform to the material requirements of ASME B16.18 or ASME B16.22, and the performance requirements of IAPMO PS117, and ICC LC1002. ProPress fittings ½-inch thru 4-inch for use with ASTM B88 copper tube type K or L and ½-inch up to include 1-1/4-inch annealed copper tube. ProPress fittings shall have an EPDM sealing element and Smart Connect (SC) feature. 2-1/2-inch thru 4-inch shall have a 420 stainless steel grip ring, PBT separator ring, EPDM sealing element and Smart Connect (SC) feature. Sealing elements shall be verified for the intended use

ProPress bronze, or copper fittings: Pipe ends shall be cut on a right angle (square) to the pipe. Pipe ends shall be reamed and chamfered, all grease, oil or dirt shall be removed from the pipe end with a clean rag. Visually examine the fitting sealing element to insure there is no damage, and it is properly seated into the fitting. Insert pipe fully into the fitting. Make a mark with a felt tip pen on the pipe at the face of the fitting. Always examine the tube to insure it is fully inserted into the fitting prior to pressing the joint. ProPress fittings ½-inch thru 4-inch shall be joined using Ridgid ProPress Tools. 2-1/2-inch thru 4-inch ProPress copper fittings shall utilize Ridgid ProPress XLC Rings, and 2-1/2-inch thru 4-inch bronze ProPress fittings shall utilize Ridgid ProPress XL Rings. ProPress fittings shall be installed according to the most current edition of the Viega installation guidelines. Sealing elements shall be verified for the intended use. Installers shall attend a Viega ProPress installation training class.

After ProPress fittings have been installed a "step test" shall be followed. Utilizing air, water, or dry nitrogen, pressurize the system not to exceed 85 psi. Walk the system and check for leaks. If you do not locate any leaks proceed to pressurize the system to the recommended pressures, not to exceed 600 psi. Should you locate a leaking joint that has not been pressed, relieve the pressure from the system, ensure the tube is fully inserted into the fitting and press the fitting. Resume test procedure, after the necessary repairs have been made. This test shall be in addition to the required hydrostatic tests specified elsewhere within the specification.

F. Steel Hydronic Pipe Mechanical Fittings by Viega MegaPress or approved equal via welded, threaded or grooved piping system method: ½-inch through 2-inch shall conform to ASME B31.1, ASME B31.3, or ASME B31.9 MegaPress fittings with zinc and nickel coating for use with IPS carbon steel pipe conforming to ASTM A53, ASTM A106, ASTM A135, or ASTM A795. MegaPress fittings shall have an EPDM sealing element, 420 stainless steel grip ring, separator ring, and an un-pressed fitting leak identification feature. Sealing elements shall be verified for the intended use. Installation must be in accordance to manufacturer's instructions and specifications

Mega Press Systems: Pipe ends shall be cut on a right angle (square) to the pipe. Pipe ends shall be reamed chamfered and all paint, laqaur, grease, oil or dirt shall be removed from the pipe end with an abrasive cloth or Viega pipe end prep tool. Visually examine the fitting sealing element to insure there is no damage, and it is properly seated into the fitting. Insert pipe fully into the fitting. Make a mark with a felt tip pen on the pipe at the face of the fitting. Always examine the pipe to insure it is fully inserted into the fitting prior to pressing the joint. MegaPress fittings hall be joined using Ridgid MegaPress Tools. MegaPress fittings shall be installed according to the most current edition of the Viega installation guidelines. Sealing elements shall be verified for the intended use. Installers shall attend a Viega MegaPress installation training class."

2.02 STEEL PIPE: CHILLED WATER SUPPLY AND RETURN (CHWS&R)

A. Pipe: Black, Schedule 40 conforming to ANSI B125.2 or B125.1. Pipe to be used for welding shall be furnished with beveled ends.

B. Fittings:

1. 2 in. and smaller, screwed, 125 lb. cast iron conforming to ANSI B16.4.

2. 2-1/2 in. and larger, screwed, 150 lb. malleable iron conforming to ANSI B16.3 or grooved.

3. For welded pipe, all sizes, standard weight black steel welding pattern conforming to ANSI B16.5, B16.9, and B16.25.

C. Joints: Screwed joints shall be made up with Teflon pipe thread tape, Teflon liquid, or other approved non-hardening joint compound applied to male thread only. Welded joints shall be made by oxyacetylene or electric arc process and comply with latest ASA "Code for Pressure Piping" requirements.

D. Any pipe 1-1/4 in. and larger may be welded or use grooved joints, no pipe larger than 3 in. shall be screwed.

E. Coil connections are to be made so the coil can be removed without cutting pipe.

2.03 CHILLED WATER SUPPLY AND RETURN (CHWS&R)

A. Copper Tube Pipe: Type L, hard drawn, conforming to ANSI H23.1.

B. Fittings: Wrought copper solder pattern conforming to ANSI B16.22.

C. Joints: Made with 95-5 tin-antimony solder using non-corrosive flux. The HVAC Subcontractor, at his option, may use the Victaulic CTS grooved copper system for 2" and larger or the Anvil International Gruvlok CTS grooved copper system for 2" and larger.

D. The HVAC Subcontractor has the option to use copper pipe on heating supply and return and heating water supply and return for 2 in. diameter piping or less.

2.04 UNIONS

A. Unions shall be of the same class and material as the pipe and fittings of the system in which they are installed. In black steel piping systems, they shall be 200 lbs. black malleable iron with brass ground joint equal to Dart Figures 0832, 0834, 0835, 0836, or 0838. In copper and brass piping, they shall be 125 lb. bronze or brass with ground joint.

B. Flanged unions for welded pipe shall be weld neck, 150 lb. raised face. Flanged joints shall be packed with impregnated asbestos gaskets placed inside the bolt circle with graphite applied to both faces.

C. Dielectric unions or waterways shall be provided between ferrous and non-ferrous piping to prevent galvanic corrosion. The dielectric unions shall meet the requirements for tensile strength of pipe fittings in accordance with Federal Specification WW-U-531 and shall be suitable for temperatures and pressures encountered. The ends shall be threaded, flanged, brazed, grooved or soldered to match adjacent piping. The metal parts of the union shall be separated so that the electrical current is below 1 percent of the galvanic current which would exist with metal to metal contact.

D. On Victaulic grooved installations, the coupling shall act as the union.

2.05 INSULATION

A. General

1. Provide materials complying with NFPA Bulletin 90-A, as determined by UL method 723, NFPA 225-ASTM E 84, and complying with the governing code, with flame spread rating under 25 and smoke developed rating under 50.
2. Where vapor barriers are used, provide intact and continuous throughout.
3. Minimum post consumer recycled content of 58.5%.
4. Acceptable manufacturers:
   - Owes/Corning Fiberglass
   - Knauf
   - Manville
   - Certainteed

B. Piping Insulation

1. All new and existing disturbed chilled water piping (supply and return) shall be insulated with 1-1/2” thick pipe insulation with a conductivity of 0.21 BTU-inch/HR-SF-F. Piping insulation shall be equivalent to Owens Corning Fiberglas™ SSL II ASJ Max with Paper Free polymer all service jacket. All condensate piping and domestic water feed lines to the hydronic system shall be insulated with minimum ½” thick pipe insulation similar to that specified above. Provide Zeston, Proto or equal polymer fittings at all elbows and fittings filled with insulation. Seal all joints and seams vapor tight. For piping 2” or greater in size provide high-density crush resistant (calcium silicate blocking or equal) insulation at all hangers. Provide 14 gauge 18” insulation shields at every hanger. Vapor barrier must be maintained continuously on all piping. All exposed piping shall be entirely jacketed with a White PVC jacket with seams sealed tight with the exception that exposed piping in mechanical rooms need not be PVC jacketed (fittings still require PVC).
2. For all insulated hydronic piping outside the building envelope, provide PVC jacket. Seal all joints and seams weathertight.

C. Refer to Ductwork Article for internal acoustical insulation.

2.06 HANGERS AND SUPPORTS

A. Provide seismic bracing as required by the Commonwealth of Massachusetts building code 780 CMR, 9th edition. HVAC Subcontractor shall hire a seismic consultant to comply with requirements of the code. All equipment and ductwork shall be seismically supported and all piping over 2" unless specifically exempt by 780 CMR. See articles on vibration and seismic control.

All horizontal piping shall be supported for its entire length. Suspended piping shall have hangers located within 2 ft. 0 in. of elbows and spacing shall be reduced, where required, to support heavy groups of fittings and valves. Grinnell Figure numbers are used to establish the desired style and quality. Other equal manufacturer, as approved by the Architect-Engineer, will be acceptable such as Anvil International. All hangers shall be UL or FM approved for the application and use.

B. Maximum spacing of hangers and supports shall be as follows:

1. Steel Pipe: 1-1/2 in. and smaller - 6 ft. 0 in.

2. Steel Pipe: 2 in. to 8 in. - 8 ft. 0 in.

3. Copper Tube: 1-1/4 in. and smaller - 5 ft. 0 in.

4. Copper Tube: 1-1/2 in. and larger - 8 ft. 0 in.

C. Pipe attachments shall be as follows:

1. All piping up to 2 in. diameter shall be supported using pipe rings or bands.

2. All systems 2-1/2 in. to 6 in. pipe sizes and insulated pipe 1-1/2 in. and smaller - Grinnell Figure 260 adjustable clevis type.

3. All systems, bare or insulated pipe 6 in. and larger - Grinnell Figure 174 or 181 adjustable swivel roll type.

4. All systems, where overhead space is limited and pipes are close to underside of beams or slabs - Grinnell Figure 171 double rod roll hanger. Pipe installed on rack supports shall be supported on pipe roll chairs or stands equal to Grinnell Figure 175 or Figure 271.

5. All vertical drops of pipe 2-1/2 in. and larger shall be supported from the floor, including all pump suction and discharge piping.

6. Pipe attachments in metal to metal contact with copper and brass pipe shall be copper plated or PVC coated.

7. On all insulated pipes, provide attachments sized for outside diameter of insulation to permit insulation to pass through hanger. Include pipe covering protection shields at all hangers.

D. Supporting rods for hangers shall be adjustable, threaded with locknuts sized as follows:

1. Pipe: 2 in. and smaller - 3/8 in.
   2-1/2 in. to 3-1/2 in. - 1/2 in.
   4 in. and 5 in. - 5/8 in.
   6 in. - 3/4 in.
   8 in. to 12 in. - 7/8 in.

2. Where double rod hangers are used, the rod size may be reduced one (1) size below the above sizes.

E. Hanger rods shall be secured to building by one of the following approved structural attachments:

1. To concrete structure - use inserts, Grinnell Figure 28, galvanized steel. Where additional supports are needed after concrete work is completed or where required in solid masonry, use self-drilling inserts equal to Phillips "Red Head" or expansion shields equal to Grinnell Figure 117. Cadmium plated piping 10 in. and larger is to be supported from wall, floor, or steel structure.

2. To overhead steel deck - use Grinnell Figure 209 toggle bolt with washers and Figure 209 rod coupling; or weld rod to 1/4 in. thick by 4 in. by 4 in. fish plate laid across top of steel deck; or bolt and weld Grinnell Figure GS-l00H channels not less than 12 in. long to underside of steel deck at right angle to ribs and attach hanger rods with GS-40 nuts.

3. To structural steel beams for pipes 2-1/2 in. to 5 in. - by beam clamps, Grinnell Figure 229, 265, or 267; 6 in. to 10 in. by bolted and welded beam attachments - Grinnell Figure 66 or 252. For pipes 2 in. and smaller, use malleable iron C-type beam clamps with retaining clip, Grinnell Figure 87; all piping is to be hung from the top chord of all steel joists. All piping 4 in. and larger shall be supported from 2 in. angle iron spanning between two (2) joists to spread loading. For joists, pipes and/or supplemental support steel must be attached to top of joist at panel points.

F. Pipes running along walls or close to floor shall be supported as follows:

1. Piping along walls may have hanger rods supported from welded steel brackets, Grinnell Figure 195, or in lieu of the above, for 4 in. and larger, may rest on adjustable roll stands supported by welded channel or I-beam wall brackets.

2. 2 in. and smaller - supported from floor on legs of angle iron, channels, or pipe legs.

3. 2-1/2 in. to 4 in. - adjustable pipe saddles, Grinnell Figure 264, supported from floor to pipe legs.

3. 4 in. and larger - pipe roll and plate, Grinnell Figure 277 supported as masonry piers and shimmed to provide proper pitch as required, or Grinnell Figure 276 adjustable pipe roll stands supported on masonry piers, welded steel channels, or I-beams.

G. Groups of horizontal pipe 3 in. and smaller, running at the same elevation, may be supported by means of vertical hangers and horizontal angles, channels, or "Unistrut" on which pipes shall rest and be held in alignment with suitable pipe clamps. Building

attachments must be sized for total load of all pipes. Details of such hangers must first be approved by the Architect-Engineer. No contact between dissimilar metal is permitted.

H. Equipment Supports:

1. Furnish and install all supplementary steel, channels, and supports required for the proper installation, mounting, and support of all equipment. Supplementary steel and channels shall be firmly connected to the building construction.

3. The type and size of the supporting channels and supplementary steel shall be of sufficient strength and size to allow only a minimum deflection in conformance with the manufacturer's requirements for loading.

4. All supplementary steel and channels shall be installed in a neat and workmanlike manner parallel at the walls, floor, and ceiling construction. All turns shall be made with 90 degree and 45 degree fittings, as required to suit the construction and installation conditions. Provide factory-fabricated tank saddles for tanks mounted on steel stands.

5. Where ceiling mounting is indicated or specified, use suspended platform or hangers, brackets, or shelf, whichever is most suitable for equipment and its location. Construct structural steel members, steel plates, rods, as required; brace and fasten to building structure or to inserts as approved.

I. Rooftop Pipe Supports: Rooftop pipe support shall be similar to Portable Pipe Hangers item number PP10 w/roller. Base Material: Injection molded high impact polypropylene with UV-inhibitors and Antioxidants. Hardware: Nuts, Washers, Rod and Roller: Hot Dip Galvanized. Coordinate with roofer prior to installation.

2.07 PIPE SLEEVES AND ESCUTCHEONS

A. Standard IPS steel or wrought iron sleeves shall be provided wherever exposed pipes pass through masonry or concrete walls or partitions. Furnish sleeves to G.C. prior to pouring concrete. Pipe sleeves are to be two (2) pipe sizes larger than line size. On insulated piping, sleeves shall be sized to allow insulation to pass through the sleeve without gouging. Within continuous vertical enclosed pipe chases, sleeves through floors may be 24 gauge galvanized sheet steel in lieu of iron pipe. In addition, where pipe passes through sheetrock walls pipe sleeves shall be 24 gauge galvanized sheet steel sized to allow insulation to pass through sleeve.

B. Iron pipe sleeves shall be provided through "wet" floors (such as kitchens, toilets, janitor's closets) and shall be extended 1 in. above finished floors. Sheet metal screws may be used in other locations and shall be cut flush with floor. Pipe sleeves in walls shall be flush with face of wall both sides. Pipe sleeves through outside walls must be caulked watertight or installed with Eclipse flanged service entrance sets.

C. Provide escutcheons equal to Grinnell Figure 10 or Figure 13, chrome plated, at all locations (except inside unfinished mechanical equipment rooms and enclosed pipe chases) wherever exposed bare pipes 4 in. or smaller pass through walls, floors, or ceilings.

2.08 VALVES

A. All valves shall be of a design, which the manufacturer lists for service and shall be of the materials allowed by the latest edition of the ASME Code for pressure piping for the pressure and temperature contemplated, unless higher grade or quality is specified herein. All valves shall be of the same manufacturer except for special applications.

B. The system shall be supplied with valves in all branch mains and risers, at all pumps, tanks, reducing and control valves, heating and cooling surfaces and at all apparatus; so located, arranged and operated as to give complete shut-off. Except where flanged or groove-ended valves are used, each connection to equipment shall be made with screwed or flanged unions on the equipment side of the valves.

C. All valves 2" in diameter and smaller shall be bronze with bronze bodies. Valves 2-1/2" in diameter and over shall have iron bodies with bronze trim (except where otherwise noted).

D. Ball valves shall be full port bronze body, bronze or stainless steel ball and stem, Teflon seats and seals, threaded ends, 400 psig cold W.O.G. by Apollo, Watts or Jenkins.

E. All bronze and iron valves shall be furnished with Teflon impregnated packing.

F. Butterfly valves shall only be allowed on piping 3" and larger and shall be tight shut- off type with angle/worm gear handle mechanism with position marker.

G. Grooved-ended butterfly valves from Victaulic shall be butterfly valve styles Masterseal or AGS-Vic-300, 300 psi CWP rated, bubble-tight/bi-directional to full rating, ductile iron body and disc, EPDM seat or Anvil International Gruvlok style 7700 or 6700, 300 psi, bronze body and EPDM rubber disc.

H. Provide valves of the type as shown on the drawings as specified herein and as scheduled:

Service	Valve Type	Rating	Remarks
Water	Ball	400 W.O.G.	all sizes
Water Throttling	Globe	200	3" and larger
Water Shut-off & Throtl.	Butterfly w/mem. stop	200	3" and larger
Drain Valves	Ball	200 W.O.G.	Hose end & cap

2.09 SPECIALTIES

A. See also valve and other sections for additional information.

B. Swing Check – Bronze body, 125 W.S.P., 200 W.O.G.

C. Grooved-ended Swing Check valves from Victaulic shall be styles 716, 716H, 779 (300 psi CWP) or W715 (230 psi CWP), ductile iron body, EPDM seat, stainless steel or ductile iron disc or Anvil International Gruvlok style 7800.

D. Dielectric unions or waterways – Provide where joining to dissimilar metals, Watts series #3000, Victaulic Clearflow, Anvil International Gruvlok 7088, 7089,7090, 7091 or approved equal.

E. Air Vents – Provide automatic air vents at all high points within the system and at all coils. Air vents shall be Sparco model #FV 147A.

F. Provide Wessels Company #GMP-18 18-gallon mix tank, pump, piping, pressure controller, valves, etc… or approved equal

2.10 SYSTEM WATER TREATMENT

A. All new piping shall be thoroughly flush with clear water and then filled with clear water and circulated for a period no less than 8 hours. Drain water, clean all strainers and then refill the chiller water system with 35% propylene glycol or other glycol which matches the existing system glycol type and concentration.

B. Provide written report to Engineer detailing initial system fill/start up test results.

C. Provide an automatic glycol system feeder pump with 18-gallon tank for the chilled water system. System shall maintain system pressure by pumping 35% propylene glycol into the system automatically as pressure dictates. Provide Wessels Company #GMP-18 18-gallon mix tank, pump, piping, pressure controller, valves, etc… or approved equal. Fill tank with 35% pre-mix after system is fully charged.

2.11 VIBRATION ISOLATION AND FLEXIBLE CONNECTIONS

A. At the chiller provide a minimum of four (4) seismic restrained spring isolators securely anchored via bolting to the roof pedestal supports and the supplemental steel frame being provided by this project under the chiller frame. Chiller shall be securely anchored to the steel frame. Isolators shall be Mason Industries model #SLRSO 1” deflection units rated for the point loads imposed at each spring. Initial model size shall be #4-8400 with the presumption that the chiller and steel frame total load is 25,000 lbs.

B. At pipe connections to chiller provide braided stainless steel flexible pipe connectors as manufactured by Mercer Rubber Co. model #FLL or equal as modified by connection type required. Units shall be of the pipe size indicated on the plans and be a minimum of 12” long.

2.12 AIR-COOLED LIQUID CHILLER (Furnished to Site by Rental Company)

A. Rental company shall deliver chiller to site on flatbed truck for removal from truck and rigging by the HVAC contractor. HVAC contractor shall coordinate with Owner’s chiller rental company for delivery times and locations.

B. Rental company shall provide factory authorized personnel to start-up and commission the chiller and integral pumps. Provide adequate time to properly map points and commission chiller with EMS vendor.

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2.13 THERMOMETERS AND PRESSURE GUAGES

A. Straight Thermometers:

1. Where indicated on the Drawings, furnish and install 7 in. long die-cast aluminum case, "Adjustable Angle" red appearing mercury tubing thermometers, H.O. Trerice Co., Cat.

A001 complete with separable stainless steel Type 304 socket, 30 degrees to 240 degrees F. range, and lagging extensions when installed in insulated pipe.

2. Thermometers to be adjusted to a position for maximum readability from normal operator's position.

3. Thermometers shall be H.O. Trerice Co., Weksler Instruments Corp., Weiss Instruments, or approved equal.

D. Pressure Gauges: Pressure gauges shall be as manufactured by Trerice, or approved equal, Series 600, 4-1/2 in. diameter, range 0 to 100 PSI (or other range as required by application), aluminum case, white face with black figures, with petcocks.

E. Provide separable stainless steel wells for each thermometer and pressure gauge. Wells for thermometers shall be filled with heat conductive gel prior to installation of thermometer.

2.14 ELECTRICAL WORK

A. The Heating, Ventilating and Air Conditioning Subcontractor shall provide all wiring for the Automatic Temperature Controls, including unit interlock, control loop power, etc.. except as otherwise specified herein.

B. The HVAC subcontractor shall hire a licensed electrician to perform all control wiring as required by code. Minimum gauge of all control wiring is 18 AWG and shall be plenum rated.

C. The Electrical Contractor shall install and do all power wiring for all motor starters and unmounted motors, furnished to him at the job site by other trades.

D. For all low voltage motors, temperature control wiring and motor control wiring, including wiring for interlocking, shall be provided by the Section providing the motors, including the installation of all control devices.

E. Furnish all starters and all other motor control devices for motor driven equipment required for the work. The Electrical Contractor shall provide all code required disconnect switches for all motors, except where otherwise noted. The setting of all motors required for mechanical equipment shall be included as part of the mechanical work.

F. Equipment which includes a number of correlated electrical control devices mounted in a single enclosure or on a common base with equipment, shall be supplied for installation completely wired as a unit with terminal boxes and ample leads ready for external wiring.

G. All electrical items called for as part of the mechanical work shall conform to NEMA Standards, to the requirements of the National Fire Protection Association and to the requirements of any local electrical code authority having jurisdiction, any field modifications required to ensure such conformance shall be included as part of the mechanical work.

2.15 ELECTRIC MOTORS

A. The HVAC Subcontractor shall provide all electric motors necessary for driving all motor driven equipment required to be furnished under this section of the Specifications.

B. All motors shall be designed for 3 phase, 60 cycle alternating current operation with 208 volt or 460 volts (see schedules) across the motor terminals, except that, unless otherwise specified herein, all motors 1/3 HP and smaller shall be designed for single phase, 60 cycle alternating current at 120 volts across the terminals.

C. The speed, horsepower, type and other essential data for each motor, if not given under paragraphs describing the various motor driven apparatus, or in schedules on the drawings shall be submitted to the Engineer for his review. All two speed motors shall be single winding type.

D. HVAC Subcontractor shall furnish premium efficient motors eligible for rebate by the local electric utility, when applicable.

2.16 AUTOMATIC TEMPERATURE CONTROLS

A. Furnish and install all control components necessary to obtain a fully functional control system as described herein. Where the word “contractor” is referred to within this article it shall mean the HVAC subcontractor and their control subcontractor unless otherwise identified such as electrical or plumbing contractor or subcontractor. It is the contractors responsibility for providing all controls, relays, etc. necessary to accomplish the Sequence of Operations and performance specified, whether or not the items are specifically identified herein. This shall include all the points shown in the control diagrams and on the drawings. Wherever a setpoint is referred to, this implies that the setting is adjustable by the user. Contractor shall hire the project electrician to provide additional power supplies to support the control devices as required.

B. The specified DDC system shall be based the most recent generation of products by Alerton, as provided by Automated Building Systems, Inc. the Owners current energy management system provider. No alternates shall be allowed. Owner’s front-end graphics must be updated to include any modifications made to systems as part of this project. The project graphics and software must be programmed into the existing city-wide Alerton server. New controls installed must seamlessly integrate into the existing Alerton system front-end graphics for trending and alarm reporting. EMS system must be BACnet and Open Protocol compatibility for direct communication with the chiller to obtain operation status of system including real time energy consumption if rental chiller is provided with an optional BACnet interface card.

C. The entire system, materials & devices as well as installing contractor and associated work shall comply with all current governing codes, ordinances and regulations including UL, NFPA, NEC, IBC, IMC, local AHJ, etc…

D. All control wiring shall be shielded plenum rated minimum 18 AWG (unless lighter gauge or heavier gauge is required due to impedance or current demands) and shall be run concealed above ceilings or within walls. When the wiring must run exposed it shall be run in EMT conduit in unfinished service spaces and in Wiremold® or equal conduit system product in finished occupiable spaces. Weathertight conduit (flexible within 3’ of chiller) shall be used where wiring and devices extend outside the building envelope.

E. It shall be division 23 00 00 responsibility to provide all personnel as required to fully coordinate with the testing, balancing, start-up and training.

F. General

1. The automatic temperature control system shall include, but not be limited to, the following components and work:

    a. Update of the existing front-end computer graphics to reflect new chiller and modified HVAC building systems. Real-time interface with controlled components.

    b. End devices such as sensors, actuators, valves, etc…

    c. Control transformers and relays.

    d Control wiring between chiller and system.

2. The failure of any single component shall not interrupt the control strategies of other operational devices.

G. OPERATOR INTERFACE / STATION

1. Update Owners existing front-end to reflect all new and modified systems.

H. INPUT/OUTPUT INTERFACE

1. Digital Inputs (DI) shall allow the monitoring of on/off signals from remote devices. The digital inputs shall provide a wetting current of 12mA at 12 vdc to be compatible with commonly available control devices.

2. Analog Inputs (AI) shall allow the monitoring of low voltage current or resistance signals and shall have a minimum resolution of 0.1% of the sensing range. Analog inputs shall be compatible with and field configurable to commonly available sensing devices.

3. Digital Outputs (DO) shall provide a continuous low voltage signal for on/off control of remote devices. Where specified in the sequences of operations or indicated on the points list, digital outputs shall have 3-position (on/off/auto) override switches, status lights, and shall be selectable for either normally open or normally closed positions.

4. Analog Outputs (AO) shall provide a modulating signal for the control of end devices. Outputs shall provide either a 0 to 10vdc or a 4 to 20 mA signal as required to provide proper control of the output device.

I. AUXILIARY CONTROL DEVICES

1. Temperature Sensors

    a. Temperature sensors shall be Resistance Temperature Detector (RTD) type or thermistors, as dictated by the requirements of this specification.

    b. Immersion sensors shall be provided with a separable stainless steel well.

    c. Sensor accuracy’s and operating ranges shall be as follows:
    - Space temp. +/- 1 deg. F, 0 to 130 deg. F range
    - O.A. Duct temp. +/- 1 deg. F, -30 to 160 deg. F range
    - Water +/- 1 deg. F, 0 to 200 deg. F range

2. Flow Switches

    a. Paddle type switch shall be provided at chiller unless otherwise noted. Device shall be adjusted to trip at the minimum flow rating of the chiller.

J. OPERATOR INTERFACE SOFTWARE

1. Alarms

    a. The stand-alone DDC unit shall provide visual notification of equipment failures, program failures, hardware failures or sensor failures. In addition each sensor and point shall be individual alarmed for values in excess of their respective high/low limits or status. When an alarm is detected, it shall be automatically stored and the user notified by displaying a message on the front display panel.

2. Scheduling

    a. The scheduling program in the stand-alone DDC unit shall provide daily, weekly and calendar scheduling capability. The master schedule shall be capable of being individually edited for each day of the week and holidays.

3. Communications

    a. The chiller shall communicate on the existing network bus extended to the chiller. Contractor shall program system to send alarms to a predefined party.

4. Energy Monitoring

    At the Owner's workstation provide software and graphically trends as required to display system operational status and energy consumption of chiller. Graphs shall report energy consumption/generation in BTU, Watts and kW over time.

K. SEQUENCE OF OPERATION - CHILLER/BOILER PLANT (CH-1)

1. The ATC system shall enable the chiller plant when outdoor temperatures exceed a setpoint of 65°F and there is a demand for cooling from the air handling systems.

2. Once the chiller is enabled it shall operate on its own factory controls. Chiller shall enable one of its two chilled water pumps and upon proof of flow through the chiller the chiller shall operate. Chiller pumps shall alternate every 72 running hours to insure even service and wear.

3. The chiller shall operate on its own internal controls, modulating capacity to maintain a system supply water temperature of 42°F subject to a minimum chiller supply outlet water temperature of no less than 40°F. If outside air dewpoint is below a setpoint of 50°F and all air handlers served by the chilled water system are meeting their respective supply air setpoint the chilled water supply temperature setpoint shall be allowed to reset from a minimum of 42°F to a maximum of 52°F as required to maintain the AHU cooling supply air setpoint demand.

4. If chiller supply water temperature falls below 36°F for longer than 60 seconds, the ATC shall disable the chiller and report an alarm condition. If the ATC has commanded the

chiller to run and flow is not proven after 60 seconds an alarm shall be reported by the ATC. Internal time-outs and safeties of the integral chiller controls shall not be bypassed.

5. Contractor shall install and field wire high limits, low water cut-offs, flow switches and vent dampers. Chiller shall not be allowed to operate if all safeties have not proved. If required by code, the contractor shall hire a licensed electrician to perform the necessary wiring and/or controls work.

6. Points List for Chiller:

   DDC Point List - Hydronic Chiller Control

   a. As a minimum, the following points shall be hard wired monitored and controlled. BACnet interface for monitoring shall only be provided if the rental chiller is provided with a BACnet card.

Inputs:	Output
O.A. Temperature AI	Chiller Enable/Disable DO
O.A. Humidity AI	Chilled Water Reset AO
Chilled Water Supply Temp AI	Demand Limit AO
Chilled Water Return Temp AI	
Chiller Status DI	
Chiller Alarm DI	
Chiller Water Flow DI	
System Pressure AI	

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of heating, ventilating and air conditioning system will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install equipment ductwork, piping and controls where shown with recognized industry standards and practices, to ensure that installation complies with requirements and serves intended purposes.

B. Coordinate with other work as necessary to interface installation of ductwork, piping and equipment with other components of systems.

C. Installation of Piping

1. HVAC Subcontractor shall examine location where the piping is to be installed and determine space conditions. Provide and erect in a workmanlike manner, according to the best practices of the trade, all piping shown on the Drawings or required to complete the installation intended by these Specifications.

2. All drain piping from condensate drain pans shall be properly trapped in accordance with the static pressures involved. Condensate drain piping sizes shall be not less than 3/4 inch.

3. This contractor is responsible for coring of all holes related to their work.

4. Provide fire safing to seal all floor and wall (where fire rated) openings around piping.

5. Provide 24 hour duration pressure test for all piping systems. Test pipe with clear water (propylene glycol mix if freezing could occur) at 1.5 times the system design pressure unless a more stringent or lengthy test is required by the local AHJ or under other Divisions. Any products or materials not rated for this pressure or the relief pressure must be isolated from the test. Provide a temporary 100 psi relief device on the tested system(s) to avoid damage due to thermal expansion during the test. Record ambient and system water pressure and temperature at start and end of test and report to Engineer. Inspect piping for leaks and if any are found repair and repeat test.

6. All new systems shall be thoroughly flushed with clear water and then filled with clear water and circulated. Drain water, clean all strainers and then refill system with 35% corrosion inhibited propylene glycol. Provide a report to Owner, Engineer and Commissioning Agent within one week of completion of flushing and cleaning.

7. Grooved Joints: Assemble joints with coupling and gasket, lubricant, and bolts. Cut or roll grooves in ends of pipe based on pipe and coupling manufacturer's written instructions for pipe wall thickness. Use grooved-end fittings and rigid or flexible, where required, grooved-end-pipe couplings. All grooved system components shall be of same manufacturer. The gasket style and elastomeric material (grade) shall be verified as suitable for the intended service as specified. Gaskets shall be molded and produced by the grooved coupling manufacturer. Grooved end shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove. A grooved factory trained field representative shall provide on-site training for HVAC Subcontractor's field personnel in the use of grooving tools, application of groove, and installation of grooved piping products. Factory trained representative shall periodically review the product installation. Only a direct employee of the grooved system manufacturer shall be considered suitable for field service. A distributor’s representative is not to be considered qualified for field service. HVAC Subcontractor shall remove and replace any improperly installed products

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D. Installation of Equipment

1. HVAC Subcontractor shall examine location where equipment is to be installed and determine space conditions and notify Engineer, in writing, of conditions detrimental to proper and timely completion of work.

2. Install equipment where shown in accordance with manufacturer's written instructions.

3.03 FIELD QUALITY CONTROL

A. Upon completion of installation of the automatic temperature control system and after motors have been energized with normal power source, test system to demonstrate compliance with requirements. When possible, field correct malfunctioning controls then retest to demonstrate compliance. Replace controls, which cannot be satisfactorily

corrected. Refer to Section - Test and Balancing. Fully coordinate all testing with the chiller manufacturer and control vendor. The balancing contractor (TAB) and the controls contractor shall submit written reports of testing procedures and findings.

B. Training of the Owner's operation and maintenance personnel is required in cooperation with the Owner's Representative. Provide competent, factory authorized personnel to provide instruction to operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems. The instruction shall be scheduled in coordination with the Owner's Representative after submission and approval of formal training plans. Refer to the Commissioning Specification for further contractor training requirements.

3.04 SERVICE

1. After completion of the control system installation, the controls contractor shall regulate and adjust all thermostats and control valves, etc., and place in complete operating condition, subject to the approval of the Owner. Complete instructions shall be given to the operating personnel. After completion of all work and all tests and at such time as designated by the owner, provide the necessary skilled personnel to operate the entire installation for a period of eight (8) hours. Training shall be broken up into multiple four (4) hour periods at the direction of the Owner.
2. Start-Up and Commissioning

   For the chiller, the rental company shall provide a factory service/start-up technician to check, test and start the chiller. Technician shall coordinate mapping of all control points with EMS contractor and commissioning of unit. Technician shall work with EMS and contractor to verify proper operation of unit. In coordination with the HVAC subcontractor and control contractor the factory technician shall provide Owner training of unit controls, maintenance, etc…

3.05 TESTING, ADJUSTING AND BALANCING (TAB)

A. All piping and equipment shall be tested. Test shall be performed in the presence of and to the satisfaction of the Owner and such other parties as may have legal jurisdiction.

B. In no case shall piping, equipment or accessories be subjected to pressure exceeding their ratings.

C. All defective work shall be promptly repaired or replaced, and the tests shall be repeated until the particular system and component parts thereof receive the approval of the Engineer.

D. It shall be division 23 00 00 responsibility to provide all personnel as required to fully coordinate with the balancer as applicable.

E. TAB contractor shall coordinate with the HVAC contractor, control contractor and chiller rental company to adjust the chiller integral pumps to deliver the specified 511 GPM to support the existing buildings chilled water demand.

F. Water System Procedures

   1. Adjustments

a. Adjust all balancing valves to provide the required fluid flow rate and pressure drop to, or through, each components.
b. System flow shall be adjusted with all automatic zone valves and control valves open.
c. Systems must balance to within 10% on individual devices and 5% per system.

G. Heating and Cooling System Procedures

1. Adjust heating and cooling systems to provide required quantity to, or through, each component.

2. Measure quantities and pressures with calibrated meters.

3. Use venturi tubes, orifices, or other metering fittings and pressure gauges to measure flow rates and to balance systems.

H. Certified Reports

1. For the reports required to be submitted under Article 1.3 of this Section, provide certification by an independent balancing and testing contractor who is versed in the field of air balancing and who is not affiliated with any firm involved in the design or construction phases of this work.

2. Identify in the reports each item not complying with the Contract requirements, or obvious misoperation or design deficiencies of equipment or controls.

3.06 LABELING

A. Provide pipe markers of either pressure sensitive tape or laminated plastic, color coded and indicating the type and direction of flow of the piping service. All new chilled water supply and return piping serving the chiller shall be labeled. Labels shall be at the inlet and outlet of the chiller and at the connections to existing piping as well as on intervals along the new pipe at a minimum of every 20 feet.

B. All equipment and starters shall be labeled with engraved laminated nametags.

3.07 PAINTING

A. Equipment installed under this Section shall have shop coat of factory applied non-lead paint, unless otherwise specified. Touch-up any scratches with matching paint. Hangers and supports shall have one coat of non-lead primer.

3.08 HOISTING MACHINERY AND EQUIPMENT

A. All hoisting equipment, rigging equipment, crane services and lift machinery required for this project shall be provided and furnished, installed, operated and maintained in safe conditions. All crane work must include an approved lift plan. Coordinate all crane activity and schedules with the Owner.

END OF SECTION 23 00 00

SECTION 260000
ELECTRICAL

PART 1 - PRIME

1.1 PRIME REQUIREMENTS

A. Work shall be inclusive but not limited to the removal of the existing electrical interior humidification unit and roof top air conditioning unit currently supporting the building then extending the branch circuit feeds to the new humidification unit and roof top location as shown on the electrical plans.

B. The Owner reserves the right to request references from this contractor and the right of final selection of the contractor.

1.2 RELATED DOCUMENTS

A. Drawings and Prime provisions of Contract, including Prime and Supplementary Conditions, Section 23 00 00 HVAC and Division 1 Specification Sections, are hereby made a part of this Section.

B. Division 23 00 00 Contractor shall be considered as the prime contractor for this project. Coordinate with the Division 23 00 00 contractor pertaining to the submission of all necessary electrical costs associated with this project.

1.3 REFERENCES

A. The PRIME DOCUMENTS, as listed in the Table of Contents, and applicable parts of Division 1, PRIME REQUIREMENTS, are hereby made a part of this Section.

B. Examine all Drawings and all other Sections of the Specifications for requirements therein affecting the work of this Trade. Refer to the HVAC plans and Division 23 00 00.

1.4 SCOPE

A. Labor, supervision, materials, tools, scaffolding, equipment, supplies, transportation and services for a complete and operational electrical system as specified shall be provided.

B. Materials and equipment shall be installed in accordance with standards of the National Electrical Code, local codes, safety codes and ordinances.

C. Work under this Section shall include, but not be limited to:

1.5 EXAMINATION OF SITE

A. Before submitting a Bid, this Contractor must visit the job site to determine the

conditions under which the work is to be done.

1.6 DRAWINGS AND SPECIFICATIONS

A. Drawings and specifications are complementary to each other. Any labor and material which is called for by either, whether or not by both, or which is necessary for the successful operation of all systems, shall be furnished and installed. Discrepancies should be brought immediately to the attention of the Architect.

B. Plans and specifications for this project should be examined to determine the scope and character of the work, the building design and function, and the required coordination with the Prime Contractor and other Trades before and during construction.

C. Any questions regarding the plans and specifications shall be addressed in writing to the Architect five (5) days before Bids close; otherwise, after the closing of the Bids, the Architect's interpretation of the meaning and intent of the plans and specifications shall be final.

D. This Contractor shall prepare an electrical set of coordination drawings to overlay with all other Trades. Drawings shall be prepared on translucent drawings to properly coordinate all of the other equipment to be installed. Prior to any installations the Electrical Contractor must receive approval of drawings from the Architect.

1.7 INSURANCE

A. Insurance is to conform to the provisions and requirements as set forth in Division 1.

1.8 CHANGES AND REVISIONS

A. Costs for changes and/or revisions shall be submitted to the Prime Contractor with material and labor breakdown of charges and credits clearly itemized.

B. Work shall not be executed until approval has been received in writing from the Architect.

1.9 WORKMANSHIP

A. Materials shall be new and shall conform to the standards of UL, Inc., in every case where such a standard has been established for the particular type of material in question. Work shall be executed in a workmanlike manner and a competent Foreman shall be provided for the entire project.

B. After wires are pulled in and fixtures and equipment are installed, this Contractor shall make tests for performance, grounds, etc., and shall

immediately remedy any defects. Equipment for tests shall be provided by this Contractor.

C. Work under this Contract must be so performed that the progress of the entire project, including work of all Trades, shall not cause delays or interference. Materials and apparatus shall be installed as fast as the condition of the building will permit.

D. It will be the responsibility of the Electrical Foreman to instruct the Owner in the function, operation and maintenance of electrical systems and equipment. This is to be done upon completion of the installation, before leaving the job site and to the satisfaction of the Owner, Engineer, and Architect.

1.10 MANUFACTURERS' NAMES AND TRADE NAMES

A. Throughout the specification types of materials may be specified by manufacturer's name and catalogue number in order to establish standards of performance and quality, and not to limit competition.

1.11 MATERIAL STORAGE AND OFFICE SPACE

A. This Contractor shall maintain at his own expense, where directed on the premises, neat-covered storage for material and equipment, and office space where drawings and specifications shall be kept for records.

B. Equipment or material damaged during the construction period shall be replaced at this Contractor's expense.

1.12 GUARANTEE

A. Materials and labor incorporated in the work are to be guaranteed against defects for a period of one (1) year from date of substantial completion. This Contractor shall correct such defects that occur within the guarantee period and to the satisfaction of the Architect without cost to the Owner, within a twenty-four (24) hour period.

B. This Contractor shall not be responsible for failures through normal usage, nor for those caused by neglect or abuse on the part of the Owner or his employees.

1.13 RELATED WORK

A. Following related work is not included in this Section and will be performed under designated Sections.

1. Major cutting and patching.

2. Fire stopping of all penetrations in rated walls and ceilings: see

FIRESTOPPING Section for acceptable material to be used on the exterior of the sleeve and around wires to be used by this Contractor. The Electrical Contractor shall be responsible for all firestopping of the interior and exterior of raceways installed through walls and floors.

1.14 CUTTING AND PATCHING

A. This Contractor as part of his work, and without extra charge, shall do fitting and minor cutting required for conduit four (4) inches and under. Cutting over four (4) inches and patching will be by the Prime Contractor. Costs for openings required due to lack of coordination shall be the responsibility of this Contractor.

1.15 OPERATING INSTRUCTIONS

A. This Contractor shall furnish electronic PDF copies for the Operating and Maintenance Manuals outlining in detail the operational features of the following systems:

1. NEMA 1 circuit breaker disconnect switch
2. Cable, junction boxes and conduit.

1.16 PERMITS

A. This Contractor shall obtain and pay for permits for the electrical systems on this project.

1.17 RECORD DRAWINGS

A. A set of record drawings shall be maintained at the job site for reference by the Engineer and Architect. Weekly, the Electrical Foreman will note changes and review drawings periodically with the Engineer. Changes, including feeders, lighting, power, panel schedules and other schedules shall be recorded on the drawings. At the conclusion of the construction this Contractor shall order from the Prime Contractor a compact disc with all drawing files. All changes shall be made on the disc and shall be compatible to that of AutoCad 2020.

1.18 DEFINITIONS

A. The terms "This Contractor", "Electrical Contractor", "Electrical Subcontractor", or "This Section" all refer to the work of this Section 26.00.00.

1.19 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. The Prime Contractor shall provide and pay for all dumpster services during the entire construction period. Suppliers and Sub-Contractors to bring all rubbish and debris to the dumpster location daily. No costs are to be assessed to the

suppliers or Sub-Contractors by the Prime Contractor for this service.

B. The Prime Contractor, Sub-Contractors and suppliers, individually, shall furnish their own staging, scaffolding, and hoisting equipment to get workers, material and equipment from the point of delivery at the project site to the point of use or installation within the building and project site.

1.20 WORK CONDITIONS/SEQUENCE

A. If Sub-Contractors find that conditions are not appropriate for them to begin the work of their trade of if they are directed to perform their work out of sequence by the Prime Contractor, or if the Prime Contractor directs Sub-Contractors to start and continue regardless of job conditions, the Sub-Contractor shall notify the Architect in writing by certified mail immediately.

PART 2 - PRODUCTS

BASIC MATERIALS AND METHODS

2.1 RACEWAYS AND FITTINGS

A. Minimum size of conduit used shall be 3/4" with no more than 9-#12 conductors. All circuits shall have separate neutrals and grounds.

B. Electrical Metallic Tubing (EMT) shall be PVC coated, mild steel, electrically welded, galvanized, Midland-Ross, Wheatland or Republic.

C. Conduit shall be kept at least six (6) inches away from adjacent copper piping or other copper work on the project. Kee pa minimum of 18” away from the natural gas line.

D. During construction, ends of conduit shall be kept tightly plugged to exclude plaster, dirt, dust, moisture and debris.

E. Ends of conduit entering boxes shall be equipped with galvanized locknuts or bushings. Cut ends of conduit shall be reamed free of burrs and sharp edges.

2.2 FIREPROOFING AND CONDUIT SEAL

A. The Electrical Contractor is responsible for all fireproofing of raceways through floors and walls.

B. The material to be used for fire-stopping shall be 3M moldable fire rated putty or 3M #CP25WB caulk to fire-stop penetrations in fire rated areas of walls and floors.

2.3 WIRING SYSTEM

A. Wiring shall be installed concealed in the construction. Wiring exposed shall be installed in heavy wall or rigid conduit.

B. Joints in wiring shall be made with approved type solderless connectors of the self-insulating type with an insulation equal to that of the conductors being joined. They shall be Minnesota Mining & Manufacturing Co., Type "Y", "R" or "B" Scotchlok, T&B Twist-on-Piggy or TUB one-piece, pressure type, self-insulating wire joint.

C. All branch circuits shall have separate grounds and neutrals.

2.4 WIRE

A. Unless otherwise specified, conductors installed in conduit shall be Type THW or THHN, 600V, 90 degree C. – Rome Cable. Conductors shall be copper.

B. MC fire-rated shall be Type THHN #12 copper conductors or as noted on the drawings.

C. Covering of wires and cables designed to meet the above specifications shall have distinctive markings as required by the latest standards of UL, Inc., making them readily identifiable in the field.

2.5 GROUNDING

A. The entire system shall be grounded in accordance with the National Board of Fire Underwriters', State and local requirements.

B. Heavy duty circuit breaker disconnect switch shall be equipped with an equipment ground connection and internal ground wire.

E. This Contractor shall furnish and install an equipment ground wire in feeder runs to meet requirements of the National Electrical Code.

F. All branch circuits shall have separate neutrals and grounds.

2.6 OUTLET BOXES

A. Outlet boxes shall be Steel City, Appleton, or Raco, galvanized of a type best adaptable to their respective use and in Prime four (4) square or octagon. Boxes in plaster areas shall be equipped with plaster rings or trim. Studs of suitable size for proper support shall be provided in boxes from which fixtures are to be hung. Exposed junction boxes are to be NEMA 3R type fully gasketed.

B. Boxes installed in tile, block or similar finished walls shall be solid flush type, square cornered, without ears, 1-2-3 and 4-gang as required - Raco, Steel City or Appleton.

C. Outlet boxes shall be provided with only the holes necessary to accommodate conduit connected. Boxes shall be furnished with lugs, ears, covers and/or outlet devices for attachment.

D. Plastic boxes are NOT acceptable.

2.7 PULL AND JUNCTION BOXES

A. Pull and junction boxes shall conform to requirements of the National Electrical Code. They shall be galvanized code gauge steel construction with removable cover plate secured by 1/4" brass machine screws. Junction boxes shall be supported to the building structure. Exposed junction boxes installed on the exterior of the building are to be NEMA 3R type fully gasketed.

2.8 SLEEVES

A. It shall be the responsibility of this Contractor to furnish and install sleeves through floors, walls, rated assemblies, etc., where necessary.

B. Sleeves shall be sealed with UL, Inc., approved fire rated material after wires have been installed. Refer to FIRESTOPPING Section.

2.9 SYSTEM OF LIGHT AND POWER

A. Secondary distribution system is 277/480V and 120/208V, 3 phase, 4 wire, 60 HZ AC.

2.10 SAFETY DISCONNECT SWITCHES

A. Safety type disconnect switches shall be circuit breaker style EATON Co., Siemens Co., Square D or Prime Electric. Boxes exposed to rain or wet conditions shall be rain-tight.

PART 3 - EXECUTION

3.1 INSPECTION AND COORDINATION

A. This Contractor shall inspect surfaces and areas that will receive his material and the job conditions as they exist and report any conditions that may adversely affect his work. Notify Architect or Prime Contractor of unsuitable conditions.

B. Coordinate work with construction schedule and job progress.

C. This Contractor shall confer with the Prime Contractor and other Trades to coordinate his work and to properly locate systems to avoid conflict and interference.

D. Any interference with the work of other Trades or with architectural or structural

details shall be brought to the attention of the Architect for decision before installation. Contractor's failure to so coordinate his work will not relieve him of the responsibility to correct work to suit building conditions.

3.2 INSTALLATION

A. Installation shall be by skilled workmen using proper equipment. Commencement of work shall be deemed as acceptance of existing conditions by installer.

B. Entire application shall be in strict accordance with manufacturer's recommendations and the standards of the National Electrical Code, local codes and ordinances, OSHA safety codes and regulations.

C. After wires are pulled in and the equipment is installed, this Contractor shall make tests for performance, grounds, etc., and shall immediately remedy defects. Equipment for tests shall be borne by this Contractor.

D. Work under this Contract must be so performed that the progress of the entire project, including work of all Trades shall not cause delays or interference. Material and apparatus shall be installed as fast as condition of the building will permit.

3.3 RACEWAYS AND FITTINGS

A. Conduit and wiring shall be installed concealed in the construction where possible. Conduit shall be installed in a neat, workmanlike manner and run parallel to building walls. Conduit size shall be minimum 3/4".

B. During building construction ends of conduit shall be tightly plugged to exclude plaster, dirt, dust and moisture.

C. Ends of conduit entering boxes shall be equipped with galvanized locknuts and bushings. Cut ends of conduit shall be reamed free of burrs and sharp edges.

D. Electrical metallic tubing couplings and terminations in outlet boxes, junction boxes, panelboard cabinets, etc., shall be secured thereto for grounding by means of raintight and concrete-tight fittings of the interlocking compression ring or stainless steel, multiple joint locking type. Set screws or indentations will not be acceptable as a method of attachment of fittings to conduit or EMT.

3.4 WIRE

A. Wire #8 and larger shall be stranded and no wire less than #12 shall be used, unless otherwise noted.

3.5 OUTLET BOXES

A. Ceiling boxes shall be supported to carry the weight of the equipment which are to be hung.

B. Outlet boxes shall be provided with only the holes necessary to accommodate the conduits being connected. Boxes shall be furnished with lugs or ears for attachment of covers and/or outlet devices.

3.6 INSTRUCTIONS TO OWNER

A. It shall be the responsibility of the Electrical Foreman to instruct the Owner in the function, operation and maintenance of electrical systems and equipment.

B. Coordinate all building shutdowns with the owner. All shutdowns are to be completed after hours.

3.7 CLEANUP

A. Stains and/or damage to the finish of the building caused by faulty workmanship and/or improper handling of material in regard to installation shall be cleaned or removed and replaced at no cost to the Owner.

3.8 FIRESTOPPING

A. The Electrical Contractor shall be responsible to fire stop all the raceways and the interior and exterior of all sleeves through which wires penetrate walls, floors or any other penetrations requiring firestopping material under this Section.

END OF SECTION