BACK UP CHILLER

AT

GREAT BAY COMMUNITY COLLEGE, PORTSMOUTH

Project GB12-11C

October 18, 2013
INVITATION TO BID – CCSNH

Sealed proposals will be accepted at the GREAT BAY COMMUNITY COLLEGE, 320 Corporate Dive, Portsmouth, NH 03801, Attention Joanne Berry, Chief Financial Officer until 3:00 PM, prevailing time, on Tuesday, November 5, 2013 for the following project:

GREAT BAY COMMUNITY COLLEGE
BACK UP CHILLER
PORTSMOUTH, NEW HAMPSHIRE 03801

Project # GB12-11C

Description:
This project consists of providing and installing a new Back Up Chiller for the existing 113,300 SF Great Bay Community College Campus Building.

1. Provide Back Up Chiller
2. Install, start up and balance New Back Up Chiller

The Project will include but not be limited to the Disciplines of: Site Construction, Concrete, Structural and Fabricated Metals, Plumbing, HVAC and Electrical Systems, etc. Estimated cost of the work to be approximately $220,000.

Plans and specifications will be available from the Community College System of New Hampshire at: www.ccsnh.edu/open-bids.

Plans and specifications are available at the following printers:

- Signature Press and Blueprinting, Inc., 45 Londonderry Turnpike, Rte. 28 Bypass, Hooksett, NH 03106;
- Reed Construction Data, 30 Technology Parkway South Suite 100 Norcross GA., 30092
- Construction Summary of NH: Inc., 734 Chestnut Street, Manchester, NH 03104;
- Infinite Imaging: 933 Islington Street, Portsmouth, NH 03801
- McGraw-Hill Construction, Dodge Plan Room: 880 Second Street, Manchester, NH 03102;
- Minuteman Press: 109 Gosling Road, Newington, NH 03801;
- Works in Progress, 20 Farrell Street, Suite 103, South Burlington, VT 05403
- Community College System of New Hampshire website: www.ccsnh.edu/open-bids

BIDDERS SHOULD ACT PROMPTLY AND SUBMIT ALL QUESTIONS IN WRITING TO MATTHEW MOORE via E-MAIL memoore@ccsnh.edu

A MANDATORY SITE WALK WILL BE HELD TUESDAY OCTOBER 28, 2013 AT 10:00A.M. MEET AT THE MAIN ENTRANCE TO THE COLLEGE BUILDING.

The Project anticipated to be substantial complete by March 28, 2014, suitable for use.

Proposals must be completed in both words and figures on forms furnished by the College, or on previously-
approved, substantially-identical forms generated by computer software, which shall be submitted in a sealed envelope marked: Proposal for: “Great Bay Community College – Back-Up Chiller GB12-11C,” received by the College as specified no later than the date and time mentioned above.

Bidders must show three recent years’ experience with installations of a similar complexity and cost and prior experience with installations of the materials within 50 miles of the project site.

The successful bidder will be required to comply with State of New Hampshire RSA#21-1:81-a. The successful bidder will be required to furnish a 100% payment and 100% performance bond prior to execution of contract.

The award will be based on the proposal that best meets the needs of the college. Factors included will be the cost, completeness of the proposal, quality of the technology provided, and experience of the contractor and installation team. The college reserves the right to waive any informality in or to reject any or all proposals.

<table>
<thead>
<tr>
<th>Category</th>
<th>Possible Points*</th>
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<tbody>
<tr>
<td>1. Cost of Base Proposal</td>
<td>50</td>
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<tr>
<td>2. Quality of the related projects/areas of expertise/experience</td>
<td>30</td>
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<tr>
<td>4. Response time to Construction and Warrantee issues</td>
<td>20</td>
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</tbody>
</table>

**Grand Total** 100*

*Maximum points for the best and so forth. Difference between scores is based on how close they are to one another. The College reserves the right to waive any and all informalities in its best interest.

All contract documents can be found on the CCSNH website at [www.ccsnh.edu/open-bids](http://www.ccsnh.edu/open-bids). Before your submission, always check for any addenda or other materials that may have been issued which would affect the invitation to bid by checking the CCSNH website at [www.ccsnh.edu/open-bids](http://www.ccsnh.edu/open-bids).

Matthew Moore, PE,
Director of Capital Projects
Community College System of New Hampshire

END OF DOCUMENT
CONTRACTOR PREQUALIFICATION FORM
THIS FORM IS TO BE SUBMITTED WITH THE PROPOSAL FORM

Great Bay Community College
Project #GB12-11C
Back Up Chiller

Qualifications to perform the work: List Three
Experience with full responsibility for work of a similar size and within 50 miles of the project site. Bidders are to provide evidence of qualifications with the bid.

<table>
<thead>
<tr>
<th>NAME OF REFERENCE PROJECT</th>
<th>Location of Project</th>
<th>Date work performed</th>
<th>Name of Owner</th>
<th>Description of Project</th>
<th>Approx Contract value</th>
</tr>
</thead>
<tbody>
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Date work performed
Name of Owner
Description of Project
Approx Contract value

END OF DOCUMENT
COMMUNITY COLLEGE SYSTEM OF NEW HAMPSHIRE
INSURANCE REQUIRED OF CONTRACTORS

TYPES OF INSURANCE REQUIRED
For the purposes of this document the term Contractor shall include each and every contractor, subcontractor, and sub-subcontractor utilized by the General Contractor to complete the construction project.

General Liability Insurance
Commercial General Liability insurance covers claims for Bodily Injury and Property damage. CCSNH requires GL insurance when:
- A contractor will be working at a CCSNH location.
- The contractor has third parties on CCSNH's premises who could be injured or cause injury to others.
- Their "completed work" (building; renovations; HVAC; etc.) may fail, causing bodily injury or property damage
- The contractor is likely to subcontract part of their work

Automobile Liability Insurance
A Business Auto Liability insurance is required when a Contractor and/or their employees and subcontractors will operate, maintain, load or unload vehicles as part of their contracted work on any campus. As such, any Contractor who drives onto CCSNH's owned or leased property should be required to provide evidence of a Commercial Automobile Liability insurance.

Umbrella/Excess Liability Insurance
An Umbrella/Excess policy is required when CCSNH is requesting total per occurrence and aggregate limits of liability that are higher than those carried by the Contractor in their “primary” General Liability, Auto Liability or Employer’s Liability (WC) policies – which is always the case. Note: General Liability policies typically provide limits of $1,000,000 per occurrence and $2,000,000 aggregate. Automobile liability policies generally provide a $1,000,000 “combined single” (CSL) limit.

Workers’ Compensation Insurance
CCSNH should request evidence of Workers’ Compensation (including Employers Liability coverage) for EACH AND EVERY Contractor. Evidence of workers’ compensation insurance from subcontractors and sub-subcontractors is the responsibility of General Contractor.

Property Insurance
When a new building is being constructed or an existing building is being renovated, coverage for the building material and the structure itself is provided by CCSNH.
However, the Contractor, all Subcontractors, and Sub-subcontractors should be aware that this “Builder’s Risk” coverage does not provide coverage for the Contractor’s business personal property – tools, equipment, etc. As such, they need to provide coverage for this exposure themselves.

**Pollution Liability Insurance**
Pollution legal liability insurance may be required if there is a chance that the Contractor may cause a first party or third party liability or property damage claim arising out of the “pollution” of any land, water or buildings by any type of “hazardous waste” material through their own actions or actions of another acting on their behalf.

**Professional/Errors & Omissions Liability Insurance**
Professional or E&O insurance is required of all Architects and Engineers who provide the design and engineering for buildings and other structures.

**LIMITS OF INSURANCE REQUIRED**
The following insurance requirements are to be used as a guide for CCSNH’s contracts with Contractors/Sub-Contractors. The insurance requirements and indemnification language that are ultimately incorporated into the contracts should be tailored to the operations and exposures with respect to the construction being performed in order to protect the interests of CCSNH and its Affiliated Entities.

**Commercial General Liability:** Contractor agrees to maintain in full force during the term of this contract and until the completion of this project Commercial General Liability insurance with the following minimum limits of liability:

- $1,000,000. per occurrence Limit for bodily injury/property damage
- $1,000,000 per occurrence Personal and advertising injury
- $2,000,000 aggregate Products/completed operations
- $2,000,000 aggregate Policy aggregate
- $5,000 per person Medical expense

These limits shall be provided per project/per job.

**Automobile Liability Insurance:** Contractor agrees to maintain in full force during the term of this contract and until the completion of this project Commercial Automobile Liability insurance for all owned, non-owned, and hired vehicles/trucks. The minimum limit of liability shall be $1,000,000 each accident, combined single limit for Bodily Injury and Property Damage.

**Workers’ Compensation Insurance:** Contractor agrees to maintain in full force and effect Workers’ Compensation insurance which provides statutory coverage for Workers’ Compensation claims and Employers’ Liability insurance subject to minimum limits of:

- $500,000 each accident Bodily injury by accident
$500,000 each employee Bodily injury by disease
$500,000 policy limit Bodily injury by disease

or the minimum limits required by Contractor’s Umbrella insurer.

**Umbrella Liability Insurance:** Contractor agrees to maintain in full force and affect Umbrella Liability insurance which provides excess following form coverage over the underlying Commercial General Liability, Automobile Liability, and Employers Liability policies previously described. The Umbrella/Excess policy will provide minimum limits of liability of $5,000,000 per occurrence and aggregate - and the aggregate limit should be provided on a “per project or job” or location basis.

**Professional Liability Insurance:** Architect/Engineer agrees to maintain in full force during the term of this contract and for a period of five years after the completion of this project, Architects and Engineers Professional Liability (Errors and Omissions) insurance subject to a minimum per occurrence and aggregate limit of $3,000,000. Note: The scope of coverage and limit provided by the policy shall encompass the Architect/Engineers obligations as defined in the project agreement.

**Personal Property Insurance:** Contractor is responsible for the purchase and maintenance of “property” insurance on a “replacement cost basis” to cover all of “property” (tools, equipment, materials, etc.) owned by the Contractor. Note: The contract should indicate that the property will “be the sole responsibility and risk of Contractor” and that “CCSNH shall not be liable for any loss, damage, or theft to such property.”

**Other Insurance:** CCSNH reserves the right to require the Contractor to maintain additional insurance coverage as deemed necessary by the nature of the contract and from time to time during the contract period.

**OTHER INSURANCE ISSUES AND REQUIREMENTS:**

**General Requirements**

Contractor is required to maintain, during the life of this contract with CCSNH, insurance that will adequately protect CCSNH and the Contractor against the exposures inherent to the contract and construction project. The insurance policies provided by Contractor must be underwritten by an insurance company that is financially sound and adequately rated (“A-” or higher) by one or more of the leading financial rating services including AM Best, Moody’s and/or Standard & Poors. The insurance companies utilized by the Contractor must be licensed to do business in the State of New Hampshire. If such insurance is provided by “self-insurance” or a Captive insurance company, adequate financial data should be provided to assure CCSNH of the Contractor’s ability to fund all deductibles, retentions and claims that occur.
Additional Insureds: The required Commercial General Liability Automobile Liability and Excess/Umbrella Liability coverage shall name CCSNH, its affiliates, subsidiaries, trustees, officers, employees and agents as additional insureds.

Certificates of Insurance (COI)
CCSNH requires the Contractor furnish Certificates of Insurance (COI) for the required coverage and limits to CCSNH before commencing work and 30 days prior to each renewal date of the required insurance policies. Such certificates shall state that, in the event of cancellation, material change in coverage or non-renewal, the Contractor will notify CCSNH at least thirty (30) days in advance via formal, written documentation.

Cancellation/Non-Renewal
In the event that any of the insurance policies purchased by the Contractor to satisfy the requirements in the contract are cancelled by the insurer, non-renewed by the Contractor or are changed materially (coverage, limits, etc.), CCSNH must be notified at least 60 days in advance of such an event. If the Contractor does not provide such notice, CCSNH has the right to procure the specified insurance coverage and charge the premiums back to the Contractor.

Occurrence/Claims Made Forms
CCSNH prefers that all Liability policies purchased by the Contractor to satisfy the requirements in the contract are written on an "occurrence" basis. However, if any liability policy must be written on a "claims made" basis, the Contractor must maintain such insurance for a minimum of three years after the termination of the contract or provide “tail coverage” if the policy is cancelled or non-renewed with a retroactive date that precedes the inception of the contract - or “prior acts” coverage without any time limitation.

#50576573
PROPOSAL FORM – LUMP SUM GRAND TOTAL BID

GREAT BAY COMMUNITY COLLEGE

BACK-UP CHILLER
PROJECT # GB 12-11

320 CORPORATE DRIVE
PORTSMOUTH, NEW HAMPSHIRE

MARCH 15, 2013

NAME OF BIDDING CONTRACTOR

LUMP SUM GRAND TOTAL

THE COLLEGE SYSTEM RESERVES THE RIGHT TO AWARD ANY OR ALL ITEMS.
PROPOSAL FORM

Proposal of:  

Address:  

To furnish all materials and to do and perform work in accordance with the plans and specifications, on which proposals shall be submitted in a sealed envelope marked: Proposal for: “Great Bay Community College – Back Up Chiller” and delivered to the Great Bay Community College – Office of the Chief Financial Officer, 320 Corporate Drive, Portsmouth, NH 03801 3:00 P.M., Prevailing Time, on November 5, 2013 for the following project:

GREAT BAY COMMUNITY COLLEGE
BACK UP CHILLER
320 CORPORATE DRIVE
PORTSMOUTH, NH 03801

Delivery of Proposal: Proposal shall be placed in sealed envelope plainly marked to indicate its contents and addressed to the College at the address shown on the Invitation to Bids. Sealed Proposals shall be received and deposited in the Bid Box at the location specified prior to the time and deposited as specified. Proposals delivered to the College by alternate means are submitted at the sole risk of the Bidder. The College will not accept responsibility for any reason if the Proposal is not deposited in the Bid Box by the specified time and date. Proposals received after the time for opening of bids will be returned to the bidder unopened.

Dr. Wildolfo Arvelo  
Great Bay Community College  
320 Corporate Drive  
Portsmouth, New Hampshire 03801

Dear President:

In accordance with the advertisement of the College inviting proposals for the project herein before named, and in conformity with the plans and specifications on file in the offices of the College, I/WE hereby certify that I AM/WE ARE the only person or persons, interested in this proposal as principals; that this proposal is made without collusion with any person, firm or corporation, that an examination has been made of the plans and specifications and of the site of the work, and proposed to furnish all necessary machinery, equipment, tools and labor, and to furnish all materials specified in the manner and at the time prescribed at the following prices:
ITEMS AND UNITS TABLE

Rules of Prices Note: This Proposal shall be filled in by the Bidder, with the Prices written in both words and numerals, and the extensions will be made by him in the spaces provided. All bidders are to include ALL items. Grand total is to include all the scope for all the projects.

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>APPROXIMATE QUANTITIES AND UNIT TYPE</th>
<th>ITEMS AND UNITS PRICES BID PER UNIT</th>
<th>COST PER UNIT DOLLARS CENTS (numerical)</th>
<th>ITEM SUBTOTAL DOLLARS CENTS (numerical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 EACH</td>
<td>ITEM #1- AL WORK DESCRIBED IN THE CONTRACT DOCUMENTS TO PROVIDE A BACK UP CHILLER TO THE GREAT BAY COMMUNITY COLLEGE (COST PER EACH WRITTEN)</td>
<td>.</td>
<td>$10,000.00</td>
</tr>
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<td>1 PER EACH</td>
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</tr>
<tr>
<td>2</td>
<td>1 EACH</td>
<td>ITEM #2- ALLOWANCE FOR UNFORESEEN CONDITIONS (COST PER EACH WRITTEN)</td>
<td>.</td>
<td>$10,000.00</td>
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<td>1 PER EACH</td>
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THE LUMP SUM GRAND TOTAL FOR THIS PROJECT IS: (SUM OF ITEM SUBTOTALS OF ITEMS #1 and #2. In numbers: [__________].)

LUMP SUM GRAND TOTAL IN WORDS:
______________________________________________________________________________________
The award of contract shall be made to the lowest responsible bidder on the basis of the Lump Sum Grand Total.

The Chancellor reserves the right to waive any and all informalities in the best interests of the College.

It is further proposed:

To execute the form of contract and to complete the project on or before March 28, 2014 and in accordance with agreed to extensions based on weather conditions.

To furnish a contract bond in the amount of one hundred percent (100%) of the contract award as security for the completion of the contract in accordance with the plans and specifications and contract documents. The form of bond shall be that provided for by the Department, and the surety shall be acceptable to the Chancellor.

To guarantee all of the work performed under this contract to be done in accordance with the plans and specifications and the contract documents.

The undersigned acknowledges receipt of the following addenda, issued during the bidding time, and states that these have been incorporated in this proposal:

Addendum No. dated

---------------------------------------------------------------------------------------------------
IF A PARTNERSHIP

Signature of Bidder: ____________________________________________

(printed name and title)

Partnership Name & Address

______________________________________________________________

______________________________________________________________

______________________________________________________________

Names and Addresses of Members of the Partnership:

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________
IF AN LLC

Signature of Bidder: ________________________________

(printed name and title)

LLC Name & Address:

_________________________________________________________________

_________________________________________________________________

Names and Addresses of Members and Managers:

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________
IF A CORPORATION

Signature of Bidder: _____________________________________________

_corporation name & address: ________________________________

____________________________
(printed name and title)

Incorporated under the laws of the State of __________________________

Names and Addresses of Corporate Officers: [A bid by a person who affixes to his/her signature, the word "President," "Secretary," "Agent" or other designation, without disclosing whom he/she is representing if other than the contracting entity noted above, may be held to the bid of the individual signing.]

President

Name: ______________________________________________________

Address: ____________________________________________________

Secretary

Name: ______________________________________________________

Address: ____________________________________________________

(Enter Designation of another Corporate Officer below, such as Vice President or Agent .....

Name: ______________________________________________________

Address: ____________________________________________________
IF A PROPRIETORSHIP

Signature of Bidder: ____________________________________________________________

(printed name and title)

Proprietorship Name & Address:

__________________________________________________________________________

__________________________________________________________________________

If Applicable, a D/B/A or Trade Name:

__________________________________________________________________________

If Applicable, Certificate from Secretary of State’s Office to be attached.

END OF DOCUMENT
AIA® Document A101™ – 2007

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year 2013
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

President
College
address
address

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

PROJECT NUMBER & TITLE

The Architect:
(Name, legal status, address and other information)

ARCHITECT/ENGINEER, TITLE
ADDRESS.
ADDRESS
ADDRESS

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

AIA Document A201™ – 2007. General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.
TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS
2 THE WORK OF THIS CONTRACT
3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
4 CONTRACT SUM
5 PAYMENTS
6 DISPUTE RESOLUTION
7 TERMINATION OR SUSPENSION
8 MISCELLANEOUS PROVISIONS
9 ENUMERATION OF CONTRACT DOCUMENTS
10 INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS
The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9. A list of Contract Documents is set forth in Exhibit A hereto.

ARTICLE 2 THE WORK OF THIS CONTRACT
The Contractor shall fully execute the Work described in the Contract Documents. The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.
(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows:

§ 3.2 The Contract Time shall be measured from the date of commencement.

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than ( )
Substantial Completion Date

(subject to adjustments of this Contract Time as provided in the Contract Documents.

(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for
bonus payments for early completion of the Work.)

3.4 Liquidated Damages: If the Contractor fails to achieve Substantial Completion on the Substantial Completion Date, as that date may be modified in accordance with the Contract, the Contractor shall pay to the Owner, or the Owner may withhold amounts otherwise due, liquidated damages in the amount of FIVE HUNDRED dollars ($500.00) per day for each day after the Substantial Completion Date. The Contractor shall be liable to the Owner for actual damages, if any, incurred by the Owner.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be ($ ), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 The Contract Sum is based upon the following alternate, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 4.3 Unit prices, if any:

(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Units and Limitations</th>
<th>Price Per Unit ($0.00)</th>
</tr>
</thead>
</table>

§ 4.4 Allowances included in the Contract Sum, if any:

(Identify allowance and state exclusions, if any, from the allowance price.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
</table>

§ 4.5 The Contract Sum is based upon the Schedule of Values set forth as Exhibit and the Qualification and Assumptions set forth as Exhibit.

ARTICLE 5 PAYMENTS

§ 5.1 PROGRESS PAYMENTS

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month. The Contractor shall, not less than ten (10) business days prior to the end of each month, submit to the Owner and the Architect, a Pencil Application for Payment which projects work to be completed and paid for through the end of the month for review by Owner and the parties shall meet by the end of the month to review jointly. By the last day of the month, the Contractor shall submit an Application for Payment.
§ 5.1.3 Provided that an Application for Payment is received by the Owner not later than the last day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the last day of the next month. If an Application for Payment is received by the Owner after the application date fixed above, payment shall be made by the Owner not later than 30 ( ) days after the Owner receives the Application for Payment.  
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Owner may require. This schedule, unless objected to by the Owner, shall be used as a basis for reviewing the Contractor’s Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

1. Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent (5%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™—2007, General Conditions of the Contract for Construction;

2. Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing). Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner’s title to such materials and equipment or otherwise protect the Owner’s interest and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site), less retainage of five percent (5%);

3. Subtract the aggregate of previous payments made by the Owner, and

4. Subtract amounts, if any, for which the Owner has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201—2007.

§ 5.1.7 The progress payment amount determined in accordance with Section 5.1.6 shall be further modified under the following circumstances:

1. Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Owner shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and

(Section 9.8.5 of AIA Document A201—2007 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)

2. Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201—2007.

§ 5.1.8 Reduction or limitation of retainage, if any, shall be as follows:  
(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.
§ 5.2 FINAL PAYMENT
§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

1. the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007, and to satisfy other requirements, if any, which extend beyond final payment; and

2. a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

ARTICLE 6 DISPUTE RESOLUTION
§ 6.1 INITIAL DECISION MAKER
The Owner will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Owner.)

§ 6.2 BINDING DISPUTE RESOLUTION
For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A201–2007, the method of binding dispute resolution shall be as follows:
(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2007

[ ] Litigation in a court of competent jurisdiction

[ ] Other (Specify)

ARTICLE 7 TERMINATION OR SUSPENSION
§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007.

ARTICLE 8 MISCELLANEOUS PROVISIONS
§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

Base Rate of the Bank of America or its successor plus one percent (1) % per annum

Init. 1


User Notes:

(1832349511)
§ 8.3 The Owner's representative:
(Name, address and other information)

Matthew Moore, PE, Interim Director of Capital Planning
Community College System of New Hampshire
26 College Drive
Concord, NH 03301

§ 8.4 The Contractor's representative:
(Name, address and other information)

NAME
CONTRACTOR
ADDRESS
ADDRESS

§ 8.5 Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.

§ 8.6 Other provisions:

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

§ 8.7 COMPLIANCE WITH APPLICABLE LAWS
§ 8.7.1 If the Contractor believes that implementation of any instruction received from the Owner would cause a violation of any applicable law, statute, ordinance, building code, rule or regulation, the Contractor shall notify the Owner in writing. Neither the Contractor nor any Contractor or Architect shall be obligated to perform any act which they believe will violate any applicable law, ordinance, rule or regulation. The Contractor shall be entitled to rely on the completeness and accuracy of the information contained in the Project Criteria, but not that such information complies with applicable laws, regulations and codes, which shall be the obligation of the Contractor to determine. In the event that a specific requirement of the Project Criteria conflicts with applicable laws, regulations and codes, the Contractor shall furnish Work which complies with such laws, regulations and codes. In such case, the Owner shall issue a Change Order to the Contractor unless the Contractor recognized or should have recognized such non-compliance prior to execution of this Agreement and failed to notify the Owner.

§ 8.8 BACKGROUND CHECKS
§ 8.8.1 The Owner reserves the right to require the Contractor to conduct background checks of any and all persons employed or controlled by the Contractor or any of its subcontractors or subconsultants, at any time, for any reason. If requested, the Contractor shall complete the requested background check to the Owner's satisfaction within a reasonable time period prescribed by the Owner.

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS
§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 9.1.1 The Agreement is this executed AIA Document A101–2007, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201–2007, General Conditions of the Contract for Construction.

§ 9.1.3 The Supplementary and other Conditions of the Contract:
§ 9.1.4 The Specifications:
( Either list the Specifications here or refer to an exhibit attached to this Agreement. )

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Date</th>
<th>Pages</th>
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</table>

§ 9.1.5 The Drawings:
( Either list the Drawings here or refer to an exhibit attached to this Agreement )

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§ 9.1.6 The Addenda, if any:

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<tr>
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<th>Date</th>
<th>Pages</th>
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</thead>
</table>

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents:

.1 AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

.2 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2007 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

ARTICLE 10 INSURANCE AND BONDS
The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2007.
( State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007.)

<table>
<thead>
<tr>
<th>Type of insurance or bond</th>
<th>Limit of liability or bond amount ($0.00)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance &amp; Payment Bond</td>
<td></td>
</tr>
</tbody>
</table>
This Agreement entered into as of the day and year first written above.

OWNER (Signature)

, President

For: Community College System of New Hampshire
(Row deleted)

CONTRACTOR (Signature)

For: Construction
Additions and Deletions Report for
AIA® Document A101™ – 2007

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has
added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the
original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part
of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by
AIA software at 16:35:57 on 10/18/2013.

PAGE 1

AGREEMENT made as of the day of in the year 2013

... President
College
address
address

... PROJECT NUMBER & TITLE


ARCHITECT/ENGINEER, TITLE
ADDRESS
ADDRESS
ADDRESS

PAGE 2

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed
in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire
and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements,
either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9. A list of Contract Documents is set forth in Exhibit A hereto.

...

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in
the Contract Documents to be the responsibility of others. Documents. The term "Work" means the construction and
services required by the Contract Documents, whether completed or partially completed, and includes all other labor,
materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractors obligations.
The Work may constitute the whole or a part of the Project.

...

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than ( ) days from the date of
 commencement, or as follows:
3.4 Liquidated Damages: If the Contractor fails to achieve Substantial Completion on the Substantial Completion Date, as that date may be modified in accordance with the Contract, the Contractor shall pay to the Owner, or the Owner may withhold amounts otherwise due, liquidated damages in the amount of FIVE HUNDRED dollars ($500.00) per day for each day after the Substantial Completion Date the Contractor fails to achieve Substantial Completion of the work. The Contractor acknowledges that the liquidated damages provided by this paragraph are reasonable and not a penalty. The Contractor shall achieve Final Completion within thirty (30) days after Substantial Completion. In the event that the Contractor, without excuse, fails to achieve Final Completion within the thirty (30) days after Substantial Completion, the Contractor shall be liable to the Owner for actual damages, if any, incurred by the Owner.

§ 4.5 The Contract Sum is based upon the Schedule of Values set forth as Exhibit and the Qualification and Assumptions set forth as Exhibit.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows: month. The Contractor shall, not less than ten (10) business days prior to the end of each month, submit to the Owner and the Architect, a Pencil Application for Payment which projects work to be completed and paid for through the end of the month for review by Owner and the parties shall meet by the end of the month to review jointly. By the last day of the month, the Contractor shall submit an Application for Payment.

§ 5.1.3 Provided that an Application for Payment is received by the Architect-Owner not later than the last day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the last day of the next month. If an Application for Payment is received by the Architect-Owner after the application date fixed above, payment shall be made by the Owner not later than 30 ( ) days after the Architect-Owner receives the Application for Payment.

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect-Owner may require. This schedule, unless objected to by the Architect-Owner, shall be used as a basis for reviewing the Contractor’s Applications for Payment.
Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of five percent (5%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™—2007, General Conditions of the Contract for Construction;

Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing), less retainage of—percent (—writing). Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site), less retainage of five percent (5%).

Subtract amounts, if any, for which the Architect-Owner has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201—2007.

Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Architect-Owner shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and

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The Architect-Owner will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201—2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker. (If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect-Owner.)

[ ] Litigation in a court of competent jurisdiction

Base Rate of the Bank of America or its successor plus one percent (1) % per annum

PAGE 6

Matthew Moore, PE, Interim Director of Capital Planning
Community College System of New Hampshire
26 College Drive
Concord, NH 03301

NAME
CONTRACTOR
ADDRESS
ADDRESS

User Notes: (1832349511)
§ 9.6.1 The Project is the construction of which the Work performed under the Contract Documents may be the whole or a part, and which may include construction by the Owner or by separate contractors.

§ 8.7 COMPLIANCE WITH APPLICABLE LAWS

§ 8.7.1 If the Contractor believes that implementation of any instruction received from the Owner would cause a violation of any applicable law, statute, ordinance, building code, rule or regulation, the Contractor shall notify the Owner in writing. Neither the Contractor nor any Contractor or Architect shall be obligated to perform any act which they believe will violate any applicable law, ordinance, rule or regulation. The Contractor shall be entitled to rely on the completeness and accuracy of the information contained in the Project Criteria, but not that such information complies with applicable laws, regulations and codes, which shall be the obligation of the Contractor to determine. In the event that a specific requirement of the Project Criteria conflicts with applicable laws, regulations and codes, the Contractor shall furnish Work which complies with such laws, regulations and codes. In such case, the Owner shall issue a Change Order to the Contractor unless the Contractor recognized or should have recognized such non-compliance prior to execution of this Agreement and failed to notify the Owner.

§ 8.8 BACKGROUND CHECKS

§ 8.8.1 The Owner reserves the right to require the Contractor to conduct background checks of any and all persons employed or controlled by the Contractor or any of its subcontractors or subconsultants, at any time, for any reason; if requested, the Contractor shall complete the requested background check to the Owner's satisfaction within a reasonable time period prescribed by the Owner.
Certification of Document’s Authenticity
AIA® Document D401™ – 2003

I, Matthew Moore, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 16:35:57 on 10/18/2013 under Order No. 0642214944_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ – 2007, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)
General Conditions of the Contract for Construction

the following PROJECT:
(Name and location or address)
Master Owner Document SOREV 1-5-12

THE OWNER:
(Name and address)
COLLEGE
ADDRESS
THE ARCHITECT:
(Name and address)

TABLE OF ARTICLES

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4 ARCHITECT
5 SUBCONTRACTORS
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8 TIME
9 PAYMENTS AND COMPLETION
10 PROTECTION OF PERSONS AND PROPERTY
11 INSURANCE AND BONDS
12 UNCOVERING AND CORRECTION OF WORK
13 MISCELLANEOUS PROVISIONS
14 TERMINATION OR SUSPENSION OF THE CONTRACT
15 CLAIMS AND DISPUTES

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
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Written Notice
- 2.3, 2.4, 3.3.1, 3.9, 3.12.9, 3.12.10, 5.2.1, 8.2.2, 9.7, 9.10, 10.2.2, 10.3, 11.1.3, 11.4.6, 12.2.2, 12.2.4, 13.3, 14, 15.4.1
- Written Orders
  - 1.1.1, 2.3, 3.9, 7, 8.2.2, 11.4.9, 12.1, 12.2, 13.5.2, 14.3.1, 15.1.2
ARTICLE 1  GENERAL PROVISIONS
§ 1.1 BASIC DEFINITIONS
§ 1.1.1 THE CONTRACT DOCUMENTS
The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT
The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. Except as provided in section 3.18, nothing contained in the Contract Documents shall be construed to create a contractual relationship (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK
The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

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

§ 1.1.5 THE DRAWINGS
The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS
The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE
Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER
The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.1.9 NUMBER AND GENDER
The pronouns "they," "them," and "their" are used with a singular antecedent that is indefinite or that does not specify gender, in lieu of the masculine singular and feminine singular pronouns "he," "she," "him," "her," "his," and "her," and accordingly "they," "them," and "their" may be singular or plural depending on their antecedents and the context.
§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS
§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. All Work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of this Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.2.4 In the event of conflicts or discrepancies among the Contract Documents, the documents shall be interpreted on the basis of the follow priorities: First, Modifications or Change Orders to the Contract Documents, those of later date having precedence over those of earlier date; Second, the Agreement between Owner and Contractor; Third, these General Conditions as modified; Fourth, Addenda to Specifications and Drawings, with later date having greater priority; Fifth, Specifications and Drawings.

Larger scale drawings shall take precedence over smaller scale drawings. Should Drawings or the Specifications disagree in themselves or with each other, the Contractor shall provide the better quality or greater quality of the Work unless otherwise directed by written addendum to the Contract.

§ 1.2.5 All indications or notations which apply to one of the number of similar situations, material or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

§ 1.2.6 Where codes, standards, requirements and publications of public and private parties are referred to in the Contract Documents, references shall be understood to be to the latest revision prior to the date bids are received or negotiations are concluded, except otherwise indicated.

§ 1.2.7 All manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the manufacturer’s written or printed directions and instructions unless otherwise indicated.

§ 1.2.8 Where the Work is to fit with existing conditions or Work to be performed by others, the Contractor shall fully and completely join the Work with such conditions or Work, unless otherwise specified.

§ 1.2.9 Exact locations of fixtures and outlets shall be obtained from the Architect before the Work is roughed in. Work installed without such information from the Architect shall be relocated at the Contractor’s expense.

§ 1.2.10 Existing condition plans and information included with the Contract Documents or otherwise made available to the Contractor were obtained by the Owner for use by the Architect in the design of the Project. The Owner does not hold out such information to the Contractor as an accurate or approximate indication of subsurface conditions, and no claim for extra cost or extension of time resulting from a reliance by the Contractor on such information shall be except allowed as provided in Section 3.7.4.

§ 1.2.11 Where no explicit quality or standards for materials or workmanship are established for Work, such Work is to be consistent with the quality of the surrounding Work and of the construction of the Project generally.

§ 1.2.12 Certain drawings (including mechanical, electrical and fire protection drawings) are diagrammatic only, and are not intended to show the alignment, physical locations or configurations of such Work. Such Work shall be installed without additional cost to the Owner to clear all obstructions, permit proper clearances for the Work of other trades, and present an orderly appearance where exposed. Prior to beginning such Work, the Contractor shall prepare coordination drawings showing the exact alignment, physical location and configuration of the components of the
mechanical, electrical, and fire protection and other allied systems and demonstrating to the Architect's satisfaction that the installation of such systems will comply with the preceding sentence. The Contractor shall be solely liable and responsible for any such costs and/or delays resulting from the Contractor's failure to coordinate such installations.

§ 1.3 CAPITALIZATION
Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, (3) the titles of other documents published by the American Institute of Architects, or (4) defined elsewhere in the Contract Documents.

§ 1.4 INTERPRETATION
In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM
If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2  OWNER
§ 2.1 GENERAL
§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 Intentionally omitted.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall, with the Contractor's cooperation when requested, secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.
§ 2.2.3 The Owner shall endeavor to furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. The Owner does not hold out such information to the Contractor as accurate, and no claim for extra cost or extension of time resulting from a reliance by the Contractor on such information shall be allowed except as provided in section 3.7.4.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness after receipt from the Contractor of a written request for such information or services. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2. The Contractor shall arrange for the reproduction of the additional Contract Documents as necessary, and the cost of such reproduction shall be included within the Contract Sum. The Owner shall cause the Architect to deliver electronic files with the Drawings to the Contractor which can be used by the Contractor to print additional sets (subject to any reasonable conditions imposed by the Architects).

§ 2.3 Owner's Right to Stop the Work
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 Owner's Right to Carry Out the Work
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

§ 2.5 Extent of Owner Approval or Consent
Owner is relying on the Architect to exercise the appropriate standard of care in connection with the design of the Work and the Contractor for execution of the Work, including all construction means, methods and techniques. Notwithstanding anything else set forth in the Contract Documents, any "approval" or "consent" by Owner in the context of the design of the Work means only approval of programmatic and/or aesthetic design intent. In the context of execution of the Work, "approval" by Owner of schedules and/or work plans means that the Owner acknowledges such activities or events for purposes of timing or coordination only.

§ 2.6 Owner-Furnished Materials, Equipment or Fixtures
If the Contract Documents require that, as part of the Work, that Contractor shall install or incorporate into the completed construction materials, equipment or fixtures furnished by Owner, Contractor's obligations under this agreement extend to such materials, equipment and fixtures on the same basis as the rest of the Work. Contractor's obligations to correct defective or non-conforming Work extends to and includes any and all materials, equipment, and fixtures furnished by Owner and to the installation thereof by the Contractor and the Subcontractors as fully as if such products had been purchased directly by Contractor or a Subcontractor for incorporation into the Work. The Contractor acknowledges that it has received and approved all information and specifications for any such Owner-furnished products sufficient so as to permit the Contractor to make this agreement. Such specifications for
Owner-furnished materials, equipment or fixtures shall be considered a part of the Contract Documents and such items, upon delivery to, and acceptance by, Contractor, shall become a part of the Work.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor’s authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect’s administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. Before starting the Work, and at frequent intervals during the progress thereof, the Contractor shall carefully study and compare the Contract Documents with each other and with the information furnished by the Owner pursuant to section 2.2 and shall at once report to the Owner’s Designated Representative any error, inconsistency or omission the Contractor may discover. Any necessary change shall be ordered as provided in Article 7, subject to the requirements of section 1.2 and other provisions of the Contract Documents. If the Contractor proceeds with the Work without such notice to the Owner’s Designated Representative, having discovered such errors, inconsistencies or omissions, or if by reasonable study of the Contract Documents the Contractor should have discovered such, the Contract shall bear all costs arising therefrom.

§ 3.2.1.1 The Drawings are generally drawn to scale; however, the figured dimensions or notes thereon shall govern. Before ordering any materials or doing any Work, the Contractor and each Subcontractor shall verify all measurements at the building site, and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of differences between the actual measurements and the dimensions indicated on the Drawings, except to the extent such differences are attributable to errors and omissions in the Contract Documents prepared by the Architect of which the Contractor is not aware (unless the Contractor should have been aware of such errors and omissions in connection with its exercise of the standard of care exercised by a reasonable contractor experienced in the type of work required) and for which correction would constitute a material change in the Work per the process set forth in Section 7.1.4 below. All differences which may be found shall be reported in writing to the Architect for consideration before proceeding with the Work. The Contractor shall give the Architect timely notice of any additional Drawings, Specifications, or instructions required to define the Work in greater detail, or to permit the proper progress of the Work.

§ 3.2.1.2 The Contractor shall not proceed with any Work not clearly and consistently defined in detail in the Contract Documents, but shall request additional Drawings or instructions from the Architect. If the Contractor proceeds with such Work without obtaining further Drawings, Specifications, or instructions, the Contractor shall correct Work performed incorrectly at the Contractor’s own cost and expense.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor’s notices or requests for information pursuant to Section 3.2.2, the
Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Section 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor’s best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures (including all safety precautions and programs) and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor believes that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall (a) give timely written notice to the Owner and Architect of the specific means, methods, techniques or procedures referred to in the Contract Documents that the Contractor believes are not safe or suitable; (b) participate in discussions with the Owner and the Architect regarding the specific means, methods, techniques or procedures referred to in the Contract Documents that the Contractor believes are not safe or suitable and (c) shall not proceed with that portion of the Work until the Owner, the Architect and the Contractor have agreed upon specific means, methods, techniques or procedures that the Contractor agrees are safe and suitable for the Work. The Contractor shall remain solely responsible for and have control over the means, methods, techniques or procedures that are employed by the Contractor for the Work, notwithstanding that such construction means, methods, techniques, sequences or procedures are (i) referred to, indicated or implied by the Contract Documents or (ii) agreed to by the Architect or Owner. In no event shall the Contractor employ construction means, methods, procedures and techniques that violate (x) requirements of any warranties applicable to the Work or (y) laws, ordinances, regulations, rules and orders which bear upon the Contractor’s performance of the Work.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor’s employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors. Nothing contained in this section shall alter the relationship between the Contractor and each Subcontractor under the applicable subcontract with respect to each such Subcontractor’s obligation for safety for persons or property.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.3.4 The Contractor shall coordinate and supervise the Work performed by Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade, as a result of improper coordination or supervision, causes delay to the general progress of the Work. The Contractor and all Subcontractors shall at all times afford each trade, any separate contractor, or the Owner, every reasonable opportunity for the installation of Work and the storage of materials.

§ 3.3.5 The Contractor shall arrange for and attend job meetings with the Owner and the Architect and such other persons as the Architect or Owner may from time to time wish to have present. The Contractor shall be represented by a principal, project manager, general superintendent or other authorized main office representative, as well as by the Contractor’s own superintendent. An authorized representative of any Subcontractor or lower tier subcontractor shall attend such meetings if the representative’s presence is required by the Owner or the Architect. Such representatives of the Contractor and the Subcontractors shall be empowered to make binding commitments on all matters to be discussed at such meetings, including costs, payments, change orders, time schedules and manpower. Any notices required under the Contract may be served on such representatives.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other
§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive. If the Contractor desires to substitute a product or method in lieu of what has been specified or shown in the Contract Documents, the Contractor may propose to do so in a written request to the Architect setting forth the following: (1) full explanation of the proposed substitution and submittal of all supporting data including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and other like information for the original specified item and the proposed substitution as necessary for a complete evaluation of the substitution; (2) reasons why the substitution is advantageous or necessary, including the benefits to the Owner and the Work in the event the substitution is acceptable; (3) the adjustment, if any, in the Contract Sum in the event that substitution is acceptable; and (4) the adjustment, if any, in the Contract Time in the event that substitution is acceptable. Proposals for substitutions shall be submitted to the Architect, with a copy to the Owner, not later than 30 days prior to the time of such substitute product or method would be incorporated in the Work or, if to be used or incorporated within 30 days of the commencement of the Work, immediately upon execution of the Agreement. No substitutions will be considered or allowed without the Contractor’s submittal of complete substantiating data and information as stated herein. Approval of a proposed substitution shall be at the sole discretion of the Owner (after consulting with the Architect).

§ 3.4.2.1 By making a request for substitution, the Contractor: (1) represents that the Contractor has investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified; (2) represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified; (3) certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect’s redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and (4) will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.

§ 3.4.2.2 The Contract Documents are intended to produce a build-out of consistent character and quality of design. All components of the building, including visible items of mechanical and electrical equipment, have been selected to have a coordinated design in relation to the overall appearance of the building. The Architect shall judge the design and appearance of proposed substitutes on the basis of their suitability in relation to the overall design of the Project, as well as for their intrinsic merits. The Architect will not approve as equal to materials specified proposed substitutes which, in the Architect’s opinion, would be out of character, obstructive, or otherwise inconsistent with the character and quality of design of the Project. In order to permit coordinated design of color and finishes, the Contractor shall, if required by the Architect, furnish the substituted material in any color, finish, texture, or pattern which would have been available from the manufacturer originally specified, at no additional cost to the Owner.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor’s employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them. The Owner may require removal of any workers from the Project that it deems unfit or not beneficial to the Project. The Owner reserves the right to require the Contractor to perform a background check of any worker employed by the Contractor or any of its subcontractors. If so request, the Contractor shall perform the background check to the Owner’s satisfaction and shall provide the results to the Owner within a reasonable time period established by the Owner.

§ 3.4.4 All manufactured materials shall be ordered to be delivered in the manufacturer’s original, unbroken packages, containers or bundles, bearing the name of the manufacturer and brand name of other designation, and all materials shall be handled, stored, installed, cleaned and protected in accordance with the manufacturer’s directions, unless otherwise indicated in the Contract Documents.

§ 3.4.5 Any product, material or equipment specified in the Contract Documents by reference to the number, symbol or title of a specified standard, such as a commercial standard, federal specification, trade association standard, or other similar or related construction industry standard, shall comply with requirements in the latest revision thereof as of the date the Owner and the Contractor execute the Agreement.
§ 3.4.6 In all cases in which a manufacturer’s name, trade name or other property designation is used in the Contract Documents in connection with a material, equipment or product to be furnished hereunder, the Contractor shall furnish the material, equipment or product of the named manufacturer(s) unless a written request for substitution is made in accordance with section 3.4.2 and the substitution is approved in writing by the Owner.

§ 3.4.7 The Contractor and all Subcontractors shall make all provisions necessary to avoid any disputes with labor unions and shall be responsible for any delays, damages or extra costs incurred as a result of such disputes. The Contractor shall be responsible for the maintenance of harmonious labor relations among its employees and the employees of its Subcontractors in such manner as will provide for harmony as far as practical among workers at the Project site. Prior to contracting with any Subcontractor, the Contractor will require such Subcontractor to certify its willingness to cooperate with not only the other Subcontractors hired by the Contractor, but also with the Owner, Architect, any other contractors hired by the Owner, and their subcontractors. Any Subcontractor not cooperating shall, at the Owner’s reasonable discretion, be dismissed by the Contractor and a qualified replacement subcontractor shall be hired at the Contractor’s expense.

§ 3.5 WARRANTY
The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 The Contractor shall be responsible for determining that all materials furnished for the Work meet all requirements of the Contract Documents. The Architect may require the Contractor to produce reasonable evidence that materials used meet such requirements, such as certified reports or past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of the Architect, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract Documents. All such data shall be furnished at the Contractor’s expense.

§ 3.5.3 The warranty provided in this section 3.5 shall be in addition to and not in limitation of any other warranty required by the Contract Documents or otherwise provided by law.

§ 3.5.4 The Contractor hereby assigns to the Owner, effective at the time of Substantial Completion of the Work, any and all manufacturer’s warranties required by the Contract Documents relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve all such manufacturer’s warranties.

§ 3.5.5 The Contractor shall procure and deliver to the Architect, prior to final payment, all special warranties required by the Contract Documents. Delivery by the Contractor shall constitute the Contractor’s guarantee to the Owner that the warranty will be performed in accordance with its terms and conditions.

§ 3.6 TAXES
The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS
§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall apply for required licenses, permits, inspections and/or approvals sufficiently in advance of the time required to allow the Contractor and/or the Architect to respond to any municipal comments, conditions or requests (including, without limitation, changes to the Work) without delaying the progress of the Work.
§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor’s cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect’s determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.7.6 The Contractor shall be responsible for familiarizing itself with the regulatory requirements governing the disposal of material, including material containing pollutants, from the site. The Owner will not recognize claims for additional disposal costs that could reasonably have been anticipated at the time of bidding.

§ 3.8 ALLOWANCES
§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,
1. allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
2. Contractor’s costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
3. whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor’s costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT
§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days.
days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection. The Owner may require the Contractor to provide additional supervision to assist the superintendent when Owner determines the workload requires it.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed. The Contractor shall remove the superintendent if requested to do so in writing by the Owner, and shall promptly replace him with a competent person reasonably acceptable to the Owner.

§ 3.9.4 The superintendent shall keep a daily log of the progress of the Work and make it available to the Owner at all times. A copy of the log shall be submitted to the Owner upon completion of the Project. Additionally, daily field reports recording work activities, labor force and other information as required by the Owner shall be prepared daily by the Contractor and each subcontractor and submitted to the Owner.

§ 3.9.5 The Contractor shall furnish to both the Owner and the Architect the names, addresses and telephone numbers of the project manager, the superintendent, the superintendent’s immediate supervisor, the superintendents of all subcontractors, and at least two other of their and their subcontractor’s authorized representatives, indicating where they can be contacted at times other than normal working hours in case of emergency.

§ 3.9.6 The Contractor’s superintendent shall not be assigned to, or become involved in, any project other than that of this Contract. He/she shall remain in attendance at the site, and, except for illness or other reason excusable to the Owner, shall be present at all times when Work of any kind is being done, including Work done during overtime. If absent for illness or other reason excusable to the Owner, a replacement having full authority and responsibility of the full-time superintendent shall be provided.

§ 3.9.7 The Contractor shall coordinate and supervise the Work performed by Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The Contractor and all Subcontractors shall at all times afford each trade, any separate contractor, or the Owner, every reasonable opportunity for the installation of Work and the storage of materials.

§ 3.10 CONTRACTOR’S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, or in the case of a GMP as part of the GMP Proposal, shall prepare and submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work (the "Schedule"). The Schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expedient and practicable execution of the Work.

§ 3.10.1.1 The Schedule shall utilize the Critical Path Method of scheduling within a format acceptable to the Owner and shall be submitted in digital and hardcopy (paper or vellum) formats. The Schedule shall be developed with and shall be subject to approval by the Owner and shall: (i) comply with and include any the Milestone Dates required by the Contract Documents, including but not limited to Substantial Completion and Final Completion for each phase of Work, along with any other Milestone Dates as required by the Owner; (ii) show the Contractor’s overall approach to the planning, scheduling and execution of the Work, including schedule activities for all Work components (“Activities”), Notice to Proceed, procurement of permits, shop drawing submittals, review and approval, anticipated design submittals, material and equipment procurement and delivery, third party interfaces (e.g., utility work), and closeout and commissioning; (iii) include only Activities with durations equal to or less than ten (10) calendar days; (iv) include logic relationships between Activities reflecting the Contractor’s as-planned sequencing of Work; and (v) identify any planned overtime.

§ 3.10.1.2 The Contractor shall monitor the progress of the Work for conformance with the requirements of the Schedule and shall promptly advise the Owner of any actual delays or potential delays. The Contractor shall deliver a written report to the Owner each month (or more frequently if requested by the Owner or the Architect) setting forth the actual progress of the Work and highlighting discrepancies between the actual progress of the Work and the Schedule (such updates are sometimes referred to in these General Conditions as "Progress Reports"). In the event any
progress report indicates delays in achievements of any Milestone Date, the Contractor shall propose in written form
an affirmative plan (the "Corrective Plan") to correct the delay, including overtime, re-sequencing of Work and/or
additional labor, if necessary, which Corrective Plan shall indicate the date by which the progress of the work will
comply with the Schedule, and shall be subject to the approval of the Owner. In no event shall any progress report or
Corrective Plan constitute an adjustment in the Schedule, Contract Time or any Milestone Date unless any such
adjustment is agreed to by the Owner and authorized pursuant to a Change Order.

§ 3.10.1.3 In the event (i) that the performance of the Work as of a Milestone Date has not progressed or reached the
level of completion required by the Schedule, and (ii) the Contractor fails to submit a Corrective Plan that is approved
by the Owner or the progress of the Work is not brought back into compliance with the Schedule on the date proposed
by an approved Corrective Plan, the Owner shall have the right to order the Contractor to take corrective measures to
expedite the progress of the work, including, without limitation, (1) supplying additional shifts or overtime, (2)
supplying the additional manpower, equipment, and facilities, (3) re-sequencing of Work, and (4) other similar
measures (hereinafter referred to collectively as "Extraordinary Measures"). Such Extraordinary Measures shall
continue until the progress of the Work complies with the stage of completion required by the Contract Documents.

The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's
compliance with the Schedule. The Contractor shall not be entitled to an adjustment in the Contract Sum in
connection with Extraordinary Measures required by the Owner under or pursuant to this Section 3.10.1. The Owner
may exercise the rights furnished the Owner under or pursuant to this Section 3.10.1 as frequently as reasonably
necessary to ensure that the Contractor's performance of the work complies with the Schedule.

§ 3.10.1.4 In conjunction with the monthly Schedule submission, the Contractor shall draft and submit to the Owner a
narrative explaining in detail all changes to the previous Schedule, lack of progress, delays, slippage or accelerations.
The Owner at any time may require the Contractor to develop and submit an additional written mitigation plan based
on feasible field actions that shall address and correct such delays, progress impediments, schedule slippage or missed
Milestone Dates.

§ 3.10.1.5 Float or slack time associated with any one chain of activities is defined as the amount of time between the
earliest start date and the latest start date or between the earliest finish date and the latest finish date for such activities,
as set forth in the Schedule required under this Agreement, including any revisions or updates thereto. The Owner
shall retain all beneficial rights to all schedule float including that resulting from any scheduled or actual completion in
less than the Contract Time. The Contractor shall in no way be entitled to any compensation for any Claims for
interference with or denial of an "early finish" or "early completion" of the Work. Extensions of time for performance
will be granted only to the extent that the equitable time adjustments for the activity or activities affected exceed the
total float along the activity chain involved at the time the change was ordered or the delay occurred. Notwithstanding
the above, the Contractor shall only be entitled to an extension of time for an excusable delay to the critical path of the
Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter
as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval.
The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be
coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review
submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in
Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the
Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE
The Contractor shall maintain at the site one record copy of the Drawings, Specifications, Addenda, Change Orders
and other Modifications, in good order and marked currently to record field changes and selections made during
construction (the "As-built Documents"), and one record copy of approved Shop Drawings, Product Data, Samples
and similar required submittals. The markups to the As-Built Documents shall consist of record information including:
(i) deviations from the Drawings made during construction; (ii) details in the Work not previously shown; (iii) changes
to existing conditions or existing conditions found to differ from those shown on the Drawings; (iv) the actual installed
position of equipment, piping conduits, light switches, electric fixtures, circuiting, ducts, dampers, access panels,
control values, drains, openings, and stub-outs; and (v) such other information as the Owner may reasonably request.
The Architect and/or the Owner’s Representative (a) make routine edits and updates to the Drawings prepared by or on behalf of the Architect that are normal in the course of construction administration at mutually acceptable times during construction of the Project and (b) deliver such updated Drawings to the Contractor (in printed and electronic form) for use by the Contractor in preparing the Record Documents (subject to any reasonable conditions imposed by the Architect or Owner’s Representative). Upon completion of the Work, the Contractor shall deliver to the Architect the marked As-Built Documents and reproducible transparencies thereof. Approval by the Architect, Owner’s Representative, and the Owner of As-Built Documents prepared by the Contractor and its Subcontractors and suppliers shall be a condition precedent to the Owner’s obligation to make final payment to the Contractor. The Contractor shall also deliver to the Architect all operations manuals for equipment as a condition precedent to final payment by Owner.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The accuracy of all such information is the responsibility of the Contractor. In reviewing Shop Drawings, Product Data, Samples, and similar submittals, the Architect shall be entitled to rely upon the Contractor’s presentation that such information is correct and accurate.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect. The portions of the Work that are the subject of the approved submittal shall be completed in accordance with such approved submittal.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect’s approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect’s approval thereof.
§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. Unless such written notice has been given, the Architect’s approval of resubmitted Shop Drawing, Product Data, Sample, or similar submittal shall not constitute approval of any changes not requested on the prior submittal.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional’s written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE
The right of possession of the premises and the improvements made thereon by the Contractor shall remain at all times in the Owner. The Contractor’s right to entry and use thereof arises solely from the permission granted by the Owner under the Contract Documents. The Contractor shall confine the Contractor’s apparatus, the storage of materials, and the operations of the Contractor’s workers to limits indicated by law, ordinances, the Contract Documents and permits and/or directions of the Architect and/or the Owner and shall not unreasonably encumber the premises with the Contractor’s materials. The Owner shall not be liable to the Contractor, Subcontractors, their employees or anyone else with respect to the condition of the premises. The Owner shall have the right to refuse admittance to the site to any agent or employee of the Contractor or Subcontractors whose presence the Owner deems hostile to the Owner’s interest.

§ 3.14 CUTTING AND PATCHING
§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold the Owner or a separate contractor the Contractor’s consent to cutting or otherwise altering the Work. Existing work that is cut, damaged, disturbed or otherwise interfered with by the Contractor, a Subcontractor, or anyone for whom they are responsible shall be fully, properly and carefully repaired by the responsible Contractor or Subcontractor. All such repairs shall be completed in a first-class manner to the satisfaction of the Architect, and shall match similar existing adjoining work.

§ 3.15 CLEANING UP
§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials from and about the Project. Immediately prior to the Architect’s inspection for Substantial Completion, the Contractor shall completely clean the premises. Concrete and ceramic surfaces shall be cleaned and washed. Resilient coverings shall be cleaned, waxed and buffed. Woodwork shall be dusted and cleaned. Sash, fixtures and equipment shall be thoroughly cleaned. Stains, spots, dust, marks and smears shall be removed from all surfaces. Hardware and all metal...
surfaces shall be cleaned and polished. Glass and plastic surfaces shall be thoroughly cleaned by professional window cleaners. All damaged, broken or scratched glass or plastic shall be replaced by the Contractor at the Contractor’s expense.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK
The Contractor shall provide the Owner and Architect safe access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS
The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturer is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION
§ 3.18.1 To the fullest extent permitted by law the Contractor shall defend (with counsel reasonably satisfactory to Owner), indemnify and hold harmless the Owner, Architect, Architect’s consultants, its lenders and affiliates, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), caused in whole or in part by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers’ compensation acts, disability benefit acts or other employee benefit acts.

§ 3.19 LIENS
§ 3.19.1 In the event that any Subcontractor, supplier or any other party for whom the Contractor is responsible establishes a lien against the Work and/or the Project site, the Contractor shall, within five days of receipt of notice from the Owner regarding such lien, cause the lien to be discharged (either by obtaining and recording a lien discharge bond from a surety and in a form acceptable to the Owner or otherwise) at no cost to the Owner, except to the extent that the lien is directly and solely attributable to a failure by the Owner to pay undisputed amounts to the Contractor as and when due under the Contract Documents. If the Contractor fails to cause the lien to be discharged within such five day period, the Owner shall have the right to withhold all further payments to the Contractor until the lien is discharged. The Owner may either (a) apply amount so withheld to discharging such lien or (b) retain such amounts until such lien is discharged or released by the Contractor or the lienor, and shall thereafter credit to the Contractor any amounts remaining after payment of the fees and expenses the Owner incurs in connection with such lien. The Contractor agrees to indemnify and hold harmless the Owner from all costs and expenses incurred by the Owner in connection with such liens. For purposes of this Section 3.19.1, the term "lien" shall mean any instrument filed with the applicable land title records which creates or perfects a lien under any lien law.

§ 3.20 PROTECTION FROM WATER DAMAGE
§ 3.20.1 In performing the Work, the Contractor shall exercise diligent efforts to protect the building and to cause all materials, supplies, systems and equipment which are delivered to the Project site from exposure to, and damage from, water. Without limiting the generality of the foregoing, the Contractor shall (a) install temporary barriers
adequate to prevent water entry to the building from openings in the roof, exterior walls or other applicable building elements to the extent related to the Work, (b) cause all materials, supplies, systems and equipment which are delivered to the Project site to be stored in a safe and secure location, packaged in a watertight manner where possible, and stored in a manner which protects such items from inclement weather, the elements (including, without limitation, rain, snow and water damage) and other damage until such items are incorporated into the work, and (c) ensure that all plumbing components and exterior elements included within the Work are constructed and installed in accordance with the Contract Documents so as not to allow water leaks or penetration.

§ 3.20.2 In addition to (and not in limitation of) the indemnification obligations of Contractor set forth in Section 3.18 above, Contractor shall defend, indemnify and hold harmless the parties indemnified under Section 3.18.1 above to the fullest extent permitted by law from all Claims arising out of or resulting from the failure of Contractor (or any subcontractor of any tier) to comply with the provisions of this Section 3.20. The foregoing indemnification shall include, without limitation, any Claim attributable to (i) bodily injury, sickness, disease or death arising out of or relating to, and (ii) the costs of any abatement, clean-up, removal and disposal (to the satisfaction of Owner) of, any mold, fungal growth, spores or the like which occurs at the Project site as a result of any failure by Contractor (or any subcontractor of any tier) to comply with the provisions of this Section 3.20.

ARTICLE 4 ARCHITECT
§ 4.1 GENERAL
§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT
§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents until the date the Architect issues the final Certificate For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor’s rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect’s consultants shall be
through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect’s evaluations of the Contractor’s Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor’s submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect’s action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect’s professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect’s review of the Contractor’s submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect’s review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect’s approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4 not involving an adjustment in the Contract Sum or an extension of the Contract Time. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner’s review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect’s responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inerestable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.12.1 The Architect may, as the Architect judges desirable, issue additional drawings or instructions indicating in greater detail the construction or design of the various parts of the Work; such drawings or instructions may be effected by field order or other notice to the Contractor, and provided such drawings or instructions are reasonably consistent with the previously existing Contract Documents, the Work shall be executed in accordance with such additional drawings or instructions without additional cost or extension of the Contract Time. If the Contractor claims...
additional cost or time on account of such additional drawings or instructions, the Contractor shall give the notice provided in Article 15.

§ 4.2.13 The Architect’s decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents and the agreement of the owner.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work and of complying with bonding, insurance and other applicable requirements under the Contract Documents, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor’s Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.2.5 The form and content of each subcontract shall be submitted to the Owner for its approval, which shall not be unreasonably withheld or delayed. Each subcontract shall expressly provide for the contingent assignment referred to in Section 5.4.1.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall ensure each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including without limitation the responsibility for safety of the Subcontractor’s Work and the obligations set forth in Section 3.18, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve
and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors. Each subcontract agreement shall state that (1) the Subcontractor agrees that the Contractor's rights under the subcontract agreement may (a) be assigned to the Owner, subject to the conditions of Section 5.4.1 of these General Conditions, (b) include agreements to mediate consistent with those in the Contract Documents and (c) be terminated without penalty or premium if the Contractor's services are terminated. By entering into a subcontract for any portion of the Work, a Subcontractor shall be deemed to have agreed to the terms of the preceding sentence as if such terms were included in its subcontract agreement, and (2) the Subcontractor shall be required to perform its Work in accordance with all applicable laws, statutes, ordinances, building codes, rules and regulations without any adjustment to the subcontract amount or time for performance.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that
   .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to
      Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the
      Subcontractor and Contractor in writing; and
   .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the
      Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor’s compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor’s obligations under the subcontract.

§ 5.5 Contractor will require each Subcontractor to employ a competent superintendent or trade foreman who shall be in attendance at the Project site during the progress of Subcontractor's Work.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER’S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site Under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.1.1 Notwithstanding anything to the contrary, the Owner shall have the right to install fixed and loose furniture, furnishings, fixtures, data communications lines, equipment and other items during the Contractor’s performance of the Work or portion(s) thereof. The Owner and the Contractor shall cooperate in scheduling and coordinating any such activities by or on behalf of the Owner. Any such installation or activities by or on behalf of the Owner shall not be deemed as acceptance of any part of any Work not completed in accordance with the Contract Documents.
§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Intentionally omitted.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7  CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.1.4 If, subsequent to execution of the Agreement, the Architect issues any proposal requests, supplemental instructions, sketches and other materials intended to further define, clarify or modify the Contract Documents
(collectively, the "Supplemental Material") Contractor shall, within ten (10) days of receiving any Supplemental Material, notify the Architect and Owner’s Representative in writing of any error, inconsistency or discrepancy that the Contractor discovers between the Supplemental Materials and the Contract Documents and indicate whether the Supplemental Material have any impact upon the Contract Sum and/or the Contract Time. Failure of the Contractor to provide such notice is hereby deemed to mean: (1) such Supplemental Materials are consistent with the Contract Documents; (2) do not require a change in the Contract Sum and/or Contract Time; and (3) Contractor is willing and able to perform all of the Work for the Contract Sum, and in accordance with all the requirements of the Contract Documents. If the Contractor notifies the Owner’s Representative and Architect that it believes the Supplemental Materials are either inconsistent with the Contract Documents and/or represent added Work or will delay performance in accordance with the Project schedule, the Owner’s Representative and Architect will review the Contractor’s response and provide the Owner with recommendations for approval or disapproval, and the Owner shall have one or more of the following options:

(a) The Owner may direct the Architect to modify that aspect of the Supplemental Materials to which the Contractor objects. The Contractor shall cooperate with the Owner, Owner’s Representative and the Architect during the modification effort and shall make recommendations appropriate to correct such portions of the Supplemental Materials. The Architect shall submit to the Contractor the revised Supplemental Materials as approved by the Owner. The Contractor shall promptly reexamine such revised Supplemental Materials as described in Section 7.1.4;

(b) If, upon review of the Contractor’s notice, the Owner (after consultation with the Architect and Owner’s Representative) believes that the portion of the Work described therein does not constitute a material change in the Work, or disagrees as to the impact claimed by the Contractor to the Contract Sum or Contract Time, as applicable, the Owner may so advise the Contractor through the Owner’s Representative or Architect. If such disagreement is not promptly resolved, the Work subject to disagreement shall be identified in a schedule (the “Disputed Work Schedule”). Whenever possible, the Owner and the Contractor shall resolve items set forth in the Disputed Work Schedule confirming such resolution in Change Orders. Items in the Disputed Work Schedule that are not resolved by the Owner and the Contractor shall be subject to the dispute resolution processes set forth in Article 15. During the pendency of such dispute resolution procedures, all items remaining in the Disputed Work Schedule shall be performed by the Contractor as required by the Contract Documents and a tentative adjustment shall be made to the Contract Sum to the extent of any undisputed aspect of the item. No adjustment shall be made to the Contract Sum for any disputed item or portion of an item. For each remaining item in the Disputed Work Schedule, the Contractor shall keep a specific, detailed accounting of the time and materials required to complete such item. Adjustments to the Schedule shall not be permitted on a tentative basis; or

(c) If, upon review of such notice from Contractor, the Owner agrees that all or a portion of the Work therein entitles the Contractor to Change Order and the Owner elects not to direct the Architect to modify the Supplemental Materials, the Owner and the Contractor shall enter into a written Change Order providing for such agreed changes to the Contract Sum and/or Contract Time, as applicable.

§ 7.1.5 Unless otherwise agreed to by the Owner, the aggregate limitation on the amount of profit and overhead that the Contractor, each Subcontractor and all lower lien subcontractors and suppliers can charge for Work performed pursuant to Change Orders and Construction Change Directives shall be as follows: (a) for the Contractor for Work performed by the Contractor’s own forces, ten percent (10%) of the cost of the Work; (b) for the Contractor for Work performed by Subcontractors, five percent (5%) of the cost of such Work; (c) for each Subcontractor for Work performed by such Subcontractor’s own forces, ten percent (10%) of the cost of such Work for overhead and for profit; and (d) for each Subcontractor for Work performed by lower tier subcontractors, five percent (5%) of the cost of such Work for overhead and for profit. This aggregate combined profit and overhead amount shall include all other markups and non-direct costs.

§ 7.2 CHANGE ORDERS
§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

1. The change in the Work;
2. The amount of the adjustment, if any, in the Contract Sum; and
3. The extent of the adjustment, if any, in the Contract Time.
§ 7.2.2 Unless expressly reserved therein, an executed Change Order shall constitute a final settlement of all matters relating to the change in the Work which is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change, any adjustments to the Contract Sum or GMP and any adjustments to the Schedule, Contract Time and/or Milestone Dates.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 Failure of the Contractor to notify the Owner of any disagreement with any proposed adjustment to the Contract Sum or Contract Time, as applicable, or method for determining them set forth in a Construction Change Directive within ten days after the date of receipt by the Contractor of such Construction Change Directive shall be deemed to be an agreement by the Contractor to the proposed adjustment to the Contract Sum or Contract Time or method for determining them set forth in such Construction Change Directive. If the Contractor disagrees in writing on a timely basis with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit in accordance with Section 7.1.5 above. In such case, and also under Section 7.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data.

(Paragraphs deleted)

If the Owner and the Contractor fail to agree on the adjustment to the Contract Sum or Contract Time, as applicable, or method for determining them arising from any Construction Change Directive, (a) the adjustment to the Contract Sum shall be the net increase or decrease in the Cost of the Work attributable to the Construction Change Directive plus mark-up per Section 7.1.5 and (b) the adjustment to the Contract Time shall be equal to the net increase or decrease (if any) in the time required to perform the entire Work attributable to the Construction Change Directive. As used in this Section, the term "Cost of the Work" for Contractor shall mean the Cost of the Work as defined in the Agreement and for Subcontractors as defined in Section 7.6 below. Any disagreement as to the determination of such items that are
not resolved by the Owner and the Contractor shall be subject to the dispute resolution procedures set forth in Article 15 of these General Conditions of the Contract.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect’s professional judgment, to be reasonably justified. The Architect’s interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK
The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

§ 7.5 BACK-UP FOR CHANGE ORDERS
§ 7.5.1 Lump Sum Proposal: The Contractor, Subcontractor or lower tier subcontractor’s proposal covering the extra Work or change will be itemized for the various components of Work and segregated by labor, material and equipment in a detailed format satisfactory to the Owner. Such format will include a material and labor quantity take-off and related pricing information and extensions (by drawing, if applicable). The Contractor will furnish his itemized lump sum proposal and the similarly detailed proposals of any Subcontractors, lower tier subcontractors or material suppliers.

§ 7.5.2 Time and Material: Should the Owner elect to have the extra Work or change performed on a time and material basis, and so notify the Contractor in writing, the Contractor, Subcontractor or lower tier subcontractor shall perform the Work in such manner. Records supporting the actual cost of the Work (as defined in the Section 7.6) performed must be kept and forwarded to the Owner’s representative. Such records include, but are not limited to, material tickets for all actual material used, daily time sheets itemizing workmen’s names and hours worked for all actual labor costs, and such other evidence as the Owner’s representative may reasonably request. Owner may require authentication of all time sheets and material tickets. If so requested, the failure to provide such authentication may constitute a waiver of any rights to payment of the Contractor, Subcontractor or any lower tier subcontractor for the extra Work or change performed.

§ 7.5.3 Unit Prices: The Contractor, Subcontractor or lower tier subcontractor’s proposal shall itemize the quantities of each item of Work for which there is an applicable unit price. The quantities must be itemized in relation to each specific Contract Drawing.

§ 7.6 ACTUAL COST OF THE WORK FOR SUBCONTRACTORS
§ 7.6.1 If performed on a time and material basis, the Actual Cost of the Work for a Subcontractor shall comprise the following elements:

§ 7.6.1.1 Direct Job Costs for Labor: The number of hours, hourly payroll cost, labor burden (as defined in 7.6.1.2) and extended totals for each item of Work to arrive at the cost for direct jobsite labor including working foremen. All other administration, clerical expense and supervision above the level of working foremen (such as general foremen, superintendent, project manager, etc.) shall be considered covered by the Subcontractor’s mark-up per Section 7.1.5.
§ 7.6.1.2 Labor Burden: The employer's net actual cost of payroll taxes (FICA, SUTA, FUTA), net actual cost of union benefits, and net actual cost for workers' compensation insurance, taking into consideration adjustments for experience modifiers, premium discounts, dividends, rebates, etc. Labor burden shall not be considered to include costs of Commercial General Liability Insurance, auto insurance or umbrella insurance which shall be considered covered by the Subcontractor's mark-up per Section 7.1.5.

§ 7.6.1.3 Direct Job Costs for Materials & Equipment: The quantity, price and extended totals for each item of Work to arrive at the costs of direct material and equipment. Appropriate amounts may be included for the rental of major equipment (defined as tools and equipment with individual purchase costs of more than $1,000) specifically needed to perform the extra Work or change. Use of small tools (defined as tools and equipment with individual purchase costs of less than $1,000) is considered covered by the mark-up percentage to be added to the direct cost of the extra work or change. Cost, for construction equipment, shall be the lower of the total expected rental cost or ownership cost equivalent including transportation charges and all applicable taxes.

§ 7.6.2 If performed on a unit price basis, the Actual Cost of Work shall comprise the following elements:

§ 7.6.2.1 Unit prices are for Work complete, measured in place (i.e., actual quantity installed) and cover profit and all other costs and expenses of the Contractor, Subcontractor or lower tier subcontractor. Unit prices include, without limit, all conditions of the Contract and all general requirements such as layout, reproduction of Drawings and Specifications, testing and inspection, shop drawing and sample coordination, supervision (field and home office), small tools and expendable items, insurance, taxes, temporary facilities and services, including access and safety provisions, “as-built” drawings, and general and administrative overhead and profit.

§ 7.6.2.2 Unit Price Application: For unit price items, additions and deletions of like items shall be algebraically summed and then multiplied by the applicable unit prices.

§ 7.6.3 Any changes undertaken without the Architect's or the Owner's authorization will not be recognized as a basis for a Claim for extra cost at a later date. If the Contractor claims that any instructions or orders, whether oral, written, by drawings, or otherwise, involve extra cost or time, and such instructions or orders are not accompanied by a written acknowledgement by the Owner or the Architect that extra payment will be made or time extended, they shall promptly so notify the Architect in writing and should not proceed with the Work until they have received a further written order to proceed, except in cases of emergency affecting life or property. No claim for extra cost or time on account of such instructions shall be valid unless the Contractor has so notified the Architect, before proceeding, that they claim extra cost and time and has received the further written order form the Owner's representative to proceed.

ARTICLE 8 TIME
§ 8.1 DEFINITIONS
§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION
§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.
§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by area-wide labor disputes not directed expressly at Contractor or any Subcontractor, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Construction Change Directive for such reasonable time as the Architect may determine. The Contractor acknowledges and agrees that (a) no adjustments to the Contract Time shall be made unless the events described above shall have the effect of actually delaying completion of components of the Work on the critical path indicated in the Schedule and (b) adjustments to Milestone Dates and/or the Contract Time will be permitted in connection with any such delay only to the extent such delay (i) is not caused, or could not have been avoided, by the Contractor, (ii) could not be limited or avoided by the Contractor's timely notice to the Owner of the delay, (iii) has an impact of at least one (1) day and (iv) has no concurrent or contributing cause for which the Contractor would not be entitled to an extension of the Contract Time. Notwithstanding anything to the contrary, the Contractor shall not be entitled to any extension in the Contract Time for delays in receiving required licenses, permits, inspections or approvals unless the Owner is required to provide or obtain such licenses, permits, inspections or approvals.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15 and this section 8.3.2 through section 8.3.8 below. Contractor's written Claim for extension of Contract Time shall be accompanied by detailed dates, correspondence, notices, and any other data which provides proof of the events which are the basis for the Claim, including a network analysis justifying the time extension. Said network analysis shall specifically detail the extension of the critical path of the Project caused by the events which underlie the time extension request.

§ 8.3.3 Should the Contractor be delayed in the performance of the Work, the Contractor shall (a) notify the Owner and the Architect in writing within three (3) days following the event or occurrence causing such delay and (b) notify the Owner and the Architect of the estimated extent of the delay and the cost, if any, which may be incurred as result of the delay within twenty-one (21) days following the event or occurrence causing such delay. If the Contractor fails to so notify the Owner and the Architect, the Contractor shall be barred from asserting any claim for compensation, expense or damages with respect to such delay.

§ 8.3.4 No claim for delay shall be allowed on account of failure of the Architect to furnish Drawings, Specifications or instructions, or to return Shop Drawings or Samples until a reasonable period of time (but in any event not less than fifteen days or such longer period as may be agreed to among the Architect, the Contractor and the Owner) after receipt by the Architect of written demand for such instructions, Drawings, or Samples, and not then unless the Contractor shows that the Architect's delay has materially interfered with the progress of the Work.

§ 8.3.5 Notwithstanding anything to the contrary in any of the Contract Documents, the Contractor acknowledges and agrees that no extension of time shall be granted on account of weather conditions except as provided for in this Section 8.3.5. A Claim by the Contractor for an increase in the Contract Time on account of weather shall only be granted if all the following conditions are met: (1) the weather during any calendar month (or pro rata portions of partial months at the beginning and end of the Contract Time) is "abnormal," as defined below; (2) the Contractor demonstrates that such abnormal weather had the effect of delaying completion of components of Work on the critical path indicated in the Construction Schedule; and (3) such Claim is made by written notice. "Abnormal weather" shall, for purposes of this Section, be limited to circumstances in which adverse weather conditions significantly exceed those which have historically been encountered, or may reasonably be expected to be encountered, at the Project site.

§ 8.3.6 If any of events described in this Section 8.3 of the General Conditions of the Contract entitle the Contractor to an extension of the Contract Time, the sole remedy of the Contractor shall be such extension of the Contract Time and the Contractor shall not be entitled to any adjustment of the Contract Sum, except as otherwise provided in the following sentence. If and to the extent that the Contract Time is extended by more than ten (10) business days solely on account of fault or neglect of the Owner or Architect, the Contract Sum shall be increased by the Contractor's reasonable and verified additional direct out of pocket costs of performing the Work to the extent directly and solely
attributable to extensions of the Contract Time on account of the fault or neglect of the Owner or Architect in excess of ten (10) business days.

§ 8.3.7 The Owner and Contractor agree that it is the intent of the Contract Documents that the Contractor shall have responsibility to achieve Substantial Completion of the Work within the Contract Time with an adequate work force, irrespective of any labor dispute (other than those of general applicability not directed at the Project, the Contractor or anyone for whom the Contractor is responsible), including picketing at or near the Project site, whether or not the Contractor is the primary employer involved in the labor dispute or a neutral employer, and whether or not the Contractor has a collective bargaining relationship with the union(s) involved in the labor dispute. Notwithstanding anything to the contrary in any of the Contract Documents, the Contractor acknowledges and agrees that no extension of time shall be granted on account of a labor dispute (other than those of general applicability not directed at the Project, the Contractor, or anyone for whom the contractor is responsible).

§ 8.3.8 If the Contractor submits a progress report indicating, or otherwise expresses an intention to achieve, completion of the Work prior to any completion date required by the Contract Documents or expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the maximum amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The Contractor shall provide to the Owner, throughout the course of the Work, reports projecting the cash flow needs of the Contractor. This report shall be prepared and delivered monthly, projecting the anticipated needs for the balance of the Project.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Owner and Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require and shall be revised if later found by the Architect to be inaccurate. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment. Each item in the schedule of values shall be exclusive of the Contractor’s Fee. The proper share of the Contractor’s Fee for each item shall be listed in a separate line or column.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At the time or times established in the Agreement for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. The format and number of copies of such Applications for Payment shall be as directed by the Owner. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents. Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner: (i) a current Contractor’s lien waiver and duly executed and acknowledged sworn statement showing all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any Subcontractor and material supplier in the requested progress payment, together with similar sworn statements from all such Subcontractors and material suppliers: (ii) duly executed waivers of mechanics’ and material suppliers’ liens from all Subcontractors and, when appropriate, from material suppliers and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment; (iii) proof of compliance with insurance and surety provisions as outlined in this Agreement; (iv) an updated Schedule that accurately reflects the current status of the Project: and (v) all information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders when such Construction Change Directives have set forth an adjustment to the Contract Sum.
§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.3.4 Contractor shall maintain record drawings as required by the Contract Documents, including for the mechanical and electrical trades, and shall review and inspect such drawings on a monthly basis. Contractor shall, on a monthly basis provide to Owner written confirmation that the record drawings are current.

§ 9.4 CERTIFICATES FOR PAYMENT
§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION
§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by Contractor, including subcontractor and/or supplier lien claims which have not been dissolved by bond by operation of law by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner or a separate contractor;

.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

.7 repeated failure to carry out the Work in accordance with the Contract Documents.

.8 failure to maintain current record drawings

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor’s portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 Intentionally omitted.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, sub-subcontractor, or vendor.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within fourteen (14) days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within fourteen (14) days after the date established in the Contract Documents the amount certified by the Architect, then the Contractor may, upon fourteen (14) additional days’ written notice to the Owner and Architect, stop the Work until
payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use and only minor items which can be corrected or completed without any material interference with the Owner's use of the Work which remains to be corrected or completed. Further, the following items are required from the Contractor prior to the Owner's issuance of the Certificate of Substantial Completion: (i) the Owner and Architect agree that the Project is ready for the use intended without any concurrent Work that will disrupt the Owner's activities; (ii) the Owner and the Architect agree that the Work has been completed in accordance with the Contract Documents, specifications, plans, drawings and all Change Orders; (iii) all HVAC systems included in the Work are functioning in accordance with the Contract Documents and a satisfactory test and balance report for said systems has been received by the Architect; (iv) all life safety systems included in the Work are functioning in accordance with the Contract Documents; (v) receipt by the Architect of the list of all outstanding Work that shall become the Punch List; and (vi) receipt by the Owner of all required final certifications and/or approvals from the governmental authorities having jurisdiction over the Work.

§ 9.8.2 Intentionally omitted.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. § 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage. Such partial occupancy or use may begin whether or not the portion is substantially complete, provided the respective responsibilities of Owner and Contractor for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have been established in writing. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.
§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) waivers of liens, in the form provided by the Owner, from the Contractor and all Subcontractors and suppliers who performed portions of the Work or supplied materials or equipment in connection with the Work, (6) the expiration of time within which any Contractor, Subcontractor or supplier could file a lien under law, (7) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner, (8) to the extent that final certificate(s) of occupancy for the Project and the certificates of inspection and operating permits described in Section 13.5.4 are required by governmental authorities to use and occupy the Project as intended, and to the extent that such items were not delivered to the Owner as a condition to Substantial completion of the Work, the final certificate(s) of occupancy for the Project and the certificates of inspection and operating permits described in Section 13.5.4, (9) the As-Built Documents and reproducible transparencies thereof, in accordance with Section 3.11, (10) all special warranties required by the Contract Documents, endorsed by the Contractor and in a form reasonably acceptable to the Architect and the Owner, and (11) all manufacturers' catalogs, instructions, and other similar data, including the necessary graphic cuts, diagrams, value charts, and the like, covering all mechanical and manually operated devices furnished and/or installed in any permanent structure. All of the foregoing items shall be submitted to the Owner in a single binder (the "Project Binder"), and the Contractor shall submit to the Owner four (4) copies of the Project Binder. As an additional condition to be satisfied prior to final payment, the Contractor's personnel or Subcontractors' or suppliers' personnel, as appropriate, shall provide the property management and operations personnel at the Property with training in the operation and maintenance of building systems and controls installed as part of the Work. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainerage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

1. liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
2. failure of the Work to comply with the requirements of the Contract Documents; or
3. terms of special warranties required by the Contract Documents.

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any Claim which has not been waived in accordance with this Agreement shall be deemed to have
accrued upon discovery by the Owner of the condition or breach upon which such Claim is based, for
the purpose of any applicable statute of limitation.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver
of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of
final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS
The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in
connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY
§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to
prevent damage, injury or loss to
.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site,
under care, custody or control of the Contractor or the Contractor’s Subcontractors or
Sub-subcontractors; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways,
structures and utilities not designated for removal, relocation or replacement in the course of
construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes,
rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their
protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract,
reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards,
promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are
necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under
supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property
insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in
whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by
any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections
10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone
directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not
attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to
the Contractor’s obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor’s organization at the site whose duty
shall be the prevention of accidents. This person shall be the Contractor’s superintendent unless otherwise designated
by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be made so as to cause damage or
create an unsafe condition.

§ 10.2.8 The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection
equipment and services, and shall comply with all reasonable recommendations regarding fire protection made by
the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal.
The area within the site limits, including all storage areas, shall be kept orderly and clean, and all combustible rubbish
shall be promptly removed from the site.
§ 10.2.9 The Contractor is responsible for maintaining the area within the site limits free of all debris and food-related trash that may harbor and/or attract rodents. The Contractor shall provide secure refuse containers for all food-related trash. The containers shall be heavy-duty refuse containers with tight-fitting domed lids, with a spring loaded flap, and no opening that allow access by rodents. The Contractor shall notify the Owner immediately whenever rodents or signs of rodents (e.g., burrows, droppings) are observed.

§ 10.2.10 The Contractor shall at all times protect excavations, trenches, buildings and materials, from rain water, ground water, backup or leakage of sewers, drains and other piping, and from water of any other origin and shall remove promptly any accumulation of water. The Contractor shall provide and operate all pumps, piping and other equipment necessary to this end.

§ 10.2.11 The Contractor shall take reasonable precautions to prevent loss or damage caused by vandalism, theft, burglary, pilferage or unexplained disappearance of property of the Owner, whether or not forming part of the Work, located within those areas of the Project to which the Contractor has control.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions and normal and/or customary construction practices will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor’s written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor’s reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 Intentionally omitted.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site.

§ 10.3.4.1 Hazardous waste that is generated by the Contractor as part of the Work shall be stored and disposed of in accordance with all applicable Federal, State and local regulations. Hazardous waste storage requirements include, but are not limited to, secondary containment, proper labeling, segregation of incompatible materials and routing inspection of storage areas. In addition, all hazardous waste containers shall be constructed of a material that is compatible with the waste, shall be in sound condition, and shall be kept securely closed at all times.

§ 10.3.4.2 The Contractor is responsible for the proper removal and disposition of all surplus chemicals (e.g., paints, lubricants, cleaning products) that they bring on-site as part of the Work. The Contractor shall not use any drain, pipe
or plumbing fixture for the disposal of any waste materials. No chemicals that the Contractor brings on-site shall remain on the Project site at the completion of the Work.

§ 10.3.4.3 To ensure that construction activities and the use of heavy equipment does not increase the risk of release of oil or hazardous materials to the environment, the Contractor shall have and implement a Spill Plan that reflects all regulatory standards. The Contractor shall immediately report all spills/releases to the Owner. The Contractor shall coordinate with the Owner regarding reporting and follow-up documentation to outside regulatory agencies.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance outside the scope of its Work solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all costs and expenses thereby incurred.

§ 10.3.7 Notwithstanding anything to the contrary, the Contractor acknowledges and agrees that the Work will likely require the removal and/or remediation of soil, debris and other items containing hazardous materials or contaminants to the extent disclosed in reports or materials previously delivered to the Contractor. All such Work shall be performed, and all such materials shall be removed and disposed of, by qualified and licensed (where required) parties engaged by the Contractor in compliance with all applicable legal requirements.

§ 10.4 EMERGENCIES
In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor’s discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 CONTRACTOR’S LIABILITY INSURANCE
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies acceptable to Owner and lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims which may arise out of or result from the Contractor’s operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be
(Paragraphs deleted)
liable. Such insurance shall include, at a minimum, the following:

§ 11.1.1.1
The Contractor shall maintain the insurance coverages set out in this Section, insuring the Contractor and its employees, agents, and designees, which insurance shall be by policies that are subject to the Owner’s approval:

a. Workers’ Compensation Insurance to cover full liability under the Workers’ Compensation laws of the state or jurisdiction in which the Project is located at the statutory limits required in said jurisdiction, including coverage for the benefits provided under United States Longshoremen’s & Harbor Workers’ Act, if applicable.

b. Employers’ Liability Insurance (with limits of not less than $500,000 per accident for Bodily Injury by accident, $500,000 each employee - by disease and $500,000 policy limit - by disease), covering operations of the Contractor.

c. Commercial General Liability ("CGL") Insurance for operations of the Contractor with coverage written at least as broad as that of the standard Commercial General Liability Insurance policy (Occurrence Form) including hazards of operations (including explosions, collapse, and underground operations), with contractual liability coverage and personal injury liability coverage for claims arising out of this Agreement. The insurance required by
this subsection (c) shall be written for not less than limits of liability as follows: $1,000,000 each occurrence for bodily injury and property damage; $2,000,000 general aggregate; and $2,000,000 aggregate products/completed operations. CGL coverage shall be written on ISO Occurrence Form CG 00 01 (10 01) or a substitute form providing equivalent coverage and shall cover liability arising from premises, operations, independent contractors, products, completed operations, and personal and advertising injury.

d. Automobile Liability Insurance covering all owned non-owned and hired automobiles, trucks, and trailers of the Contractor. Such insurance coverage shall be written at least as broad as that of the Standard Commercial Automobile Liability policy and shall be written for not less than a $1,000,000 limit of liability per occurrence for bodily injury and property damage.

e. Should aircraft or watercraft of any kind be used by Contractor, any tier of Subcontractor or by anyone else on their behalf, Contractor or Subcontractor shall maintain or cause the operator of the aircraft/watercraft to maintain Aircraft/Watercraft Public Liability Insurance including bodily injury, property damage, and passenger liability, with respect to any aircraft/watercraft owner, used, operated or hired in connection with the Work the Contractor, Subcontractor or anyone else written for not less than a $5,000,000 limit of liability per occurrence for bodily injury and property damage.

f. Should the performance of this Agreement require the Contractor, any tier of subcontractor or anyone else on their behalf to conduct any activities in the vicinity of a railroad, the Contractor or Subcontractor shall maintain such Railroad Protective Insurance as may be required by the affected railroad written for not less than the limits required by such railroad. The Contractor’s Railroad Protective Insurance shall be written on the policy form required by the affected railroad.

g. Excess or Umbrella Liability Insurance with coverage written at least as broad as those of the primary policies required by this Subsections1 (b), (c), (d) and (e) above and written for not less than a $10,000,000 limit of liability per occurrence

§ 11.1.1.2 Each insurance policy to be maintained under the prior Section, subparts 1 (b), (c), (d), (e), (f), and (g), shall be endorsed to name as Additional Insureds: the Owner, Owner’s Representative, Architect and the trustees, directors, officers, agents, consultants, servants and employees of each of them and all other interests as may be reasonably required by the Owner. Such parties shall be included as Additional Insureds on the CGL and Umbrella using ISO Additional Insured Endorsement CG 20 10 (11 85) or CG 20 33 (10 01) AND CG 20 37 (10 01) or an endorsement providing equivalent coverage to the additional insureds. This insurance for the Additional Insureds shall be as broad as the coverage provided for the named insured. Such insurance shall apply as primary and non-contributing insurance before any other insurance or self insurance, including any deductible, maintained by, or provided to, the Additional Insured. If the Additional Insureds have other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis and apply to the Additional Insureds only. The amount of Contractor’s insurance shall not be reduced by the existence of such other insurance. All Subcontractors shall provide endorsements naming the Contractor, the Owner, Owner’s Representative, Architect, and any lenders of Owner and all other parties required by this Agreement as “Additional Insureds” on their CGL and Umbrella policies using the same ISO forms or combinations of forms. Contractor and all Subcontractors shall maintain CGL and Umbrella coverage for themselves and all additional insureds for the duration of the Work and maintain Completed Operations coverage for themselves and the Additional Insureds for at least six (6) years after Substantial Completion of the Work.

§ 11.1.1.3 Prior to the date on which Contractor commences the performance of the Work, the Contractor shall cause to be furnished to the Owner the Certificate of Insurance for the coverages required by this Agreement to be maintained by Contractor with insurance carriers acceptable to the Owner. As and when the Owner may direct, copies of the actual insurance policies or renewals or replacements thereof shall be submitted to the Owner. All copies of policies, if any, and Certificates of Insurance submitted to the Owner shall be in form and content acceptable to the Owner. In the event of Contractor maintains insurance with limits exceeding the limits required hereunder, the Certificate of Insurance shall state the full extent of the coverage available to the above Additional Insureds. Such excess liability coverage will inure to the benefit of the Additional Insureds in the event of loss in excess of the minimum insurance required herein. Contractor will obtain and maintain copies of Certificates of Insurance from all Subcontractors.
§ 11.1.4 Contractor shall require all policies of insurance that are secured and maintained by Contractor to include clauses providing that each carrier shall waive all of its rights of recovery, under subrogation or otherwise, against the Owner, Owner’s Representative, Architect and their affiliates. In addition, Contractor waives all rights of recovery against the Owner, Owner’s Representative and/or Architect it may have or acquire because of deductible clauses in or inadequacy of limits of any policies of insurance that are in any way related to the Work or activities of Contractor. Nothing contained herein shall relieve contractor from its obligations to exercise due care in the performance of its duties in under this Contract. If the Contractor fails to furnish and maintain the required insurance, the Owner may, at its option, purchase such insurance on behalf of the Contractor, and Contractor shall pay the cost thereof to the Owner upon demand and shall furnish to the Owner any information needed to obtain such insurance.

§ 11.1.2 Intentionally omitted.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days before written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness. These certificates shall set forth evidence of all coverage required by Section 11.1.1. The form of certificates shall be the ACCORD form. Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending limits of coverage.

§ 11.1.4 Intentionally omitted.

§ 11.2 OWNER’S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner’s usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder’s risk “all-risk” or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an “all-risk” or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of such insured loss. The Owner’s property insurance will not cover hoists, tools, or other equipment belonging to the Contractor or any Subcontractor.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.
§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles unless such loss is due to the fault or neglect of Contractor or a party for whom Contractor is responsible.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE
The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE
The Owner, at the Owner’s option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner’s property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other hazards however caused to the extent covered by insurance.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

*(Paragraph deleted)*

§ 11.3.5 Intentionally omitted.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days’ prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION
The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect’s consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, the Architect’s consultants, separate contractors described in Article 6, if any, and the subcontractors, the sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner’s property insurance shall be adjusted by the Owner in good faith and made payable to the Owner for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.
§ 11.3.9 Intentionally omitted.

§ 11.3.10 The Owner shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract. The cost of all bonds premiums shall be a cost of the work. If the construction manager requires bonding of subcontractors, this cost shall be noted as a separate cost item on the subcontractors bid and contract. The owner shall have the right to reject the bond cost for subcontractors as a cost of the work and require the construction manager to carry the cost as part of the base fee.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.5.1.1 In addition, should anyone claiming by, through or under Contractor assert a mechanic's lien on the Project alleging non-payment for work, labor and materials or other similar claims regarding the Project, Contractor shall be obligated to obtain a bond pursuant to applicable law, or if acceptable to Owner, other lawful and satisfactory security, to discharge said lien and to clear the title of the Project.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, and any cost, expenses, loss or damages to the Owner resulting from such failure or defect, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4. This obligation under the Section 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract.
§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work. This obligation under this Section 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract.

§ 12.2.2.3 Intentionally omitted.
§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor’s correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor’s liability with respect to the Contractor’s obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK
If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable, but in such event, the Owner’s acceptance shall not be deemed a waiver of any other rights the Owner has hereunder. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS
§ 13.1 GOVERNING LAW
The Contract shall be governed by the law of the place where the Project is located.

§ 13.2 SUCCESSORS AND ASSIGNS
§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other; provided, however, that either party may assign this Agreement or any rights acquired hereunder without the other party’s consent if such assignment is to any corporation or entity which may hereafter become the party’s successor-in-interest or which purchases all or substantially all of the party’s assets. In the event an assignment is approved, the assignee must expressly assume all obligations and liabilities of the assignor hereunder, and such assignment will not relieve the assignor of its obligations hereunder. Any attempt at assignment without the consent of the other party as provided herein shall be deemed null and void and a material breach of this Agreement. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 Notwithstanding the foregoing, the Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner’s rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE
Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.
§ 13.4 RIGHTS AND REMEDIES
§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS
§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner’s expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect’s services and expenses shall be at the Contractor’s expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST
Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS
The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
§ 14.1 TERMINATION BY THE CONTRACTOR
§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other
persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

1. Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
2. An act of government, such as a declaration of national emergency that requires all Work to be stopped;
3. Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
4. The Owner has failed to furnish to the Contractor promptly, upon the Contractor’s request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days’ written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner’s obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days’ written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE
§ 14.2.1 The Owner may terminate the Contract if the Contractor
1. repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
2. fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
3. repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
4. otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:
1. Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
2. Accept assignment of subcontracts pursuant to Section 5.4; and
3. Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect’s services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.
§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE
§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE
§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

.1 cease operations as directed by the Owner in the notice;
.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work in place.

ARTICLE 15  CLAIMS AND DISPUTES
§ 15.1 CLAIMS
§ 15.1.1 DEFINITION
A Claim is a demand or assertion by the Contractor seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question by the Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the Contractor.

§ 15.1.2 NOTICE OF CLAIMS
Claims by either the Contractor must be initiated by written notice containing a clear statement of the basis of the Claim and the relief sought by the Contractor, and such notice shall be provided to the Owner and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by the Contractor must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the Contractor first recognizes the condition giving rise to the Claim, whichever is later; provided that, in the case of a Claim based upon delay to the Contractor, as a condition precedent to any Claim, the Contractor shall first provide initial notice of a delay within 3 days of the event giving rise to the delay, and then provide a Claim within such 21 day period thereafter; and further provided, however, that the Contractor shall use its best efforts to furnish the Architect and the Owner, as expeditiously as possible, with notice of any Claim including, without limitation, those in connection with concealed or unknown conditions, once such Claim is recognized, and shall cooperate with the Architect and the Owner in an effort to mitigate the alleged or potential damages, delay or other adverse consequences arising out of the condition which is the cause of such a Claim. THE CONTRACTOR EXPRESSLY AGREES THAT FAILURE OF THE CONTRACTOR TO INITIATE A CLAIM WITHIN THE TIME LIMITS SPECIFIED IN THIS SECTION 15.1.2 SHALL RESULT IN SUCH CLAIM BEING WAIVED

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE
Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments that are not in dispute in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.
§ 15.1.4 CLAIMS FOR ADDITIONAL COST
If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided in Section 15.1.2 shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME
§ 15.1.5.1 Contractor shall advise the Owner and Architect in writing of any known delay within three (3) days of its knowledge of the same (including delays in the receipt of drawings or designs from designer or Architect), and shall include an identification of the delay, its anticipated duration and its anticipated effect on the prosecution and completion of the Work. If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided in Section 15.1.2 shall be given. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary. The Contractor shall have the burden of demonstrating the effect of the claimed delay on the Contract Time, and shall furnish the Owner and Architect with such documentation relating thereto as they may reasonably require. The Contractor shall take all prudent steps necessary to minimize the delay, and shall diligently proceed to complete the Work as required by the Contract Documents. Notwithstanding the foregoing, time for performance of a party’s obligations hereunder shall not be tolled unless and until the party claiming such excuse has provided the other party with written notice of the event.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. Claims arising from adverse weather conditions shall be subject to the provisions of Section 8.3.5.

§ 15.1.6 Intentionally omitted.

(Paragraph deleted)
§ 15.1.7 No extension of time shall be granted to the Contractor for delays occurring to parts of the Work that have no measurable impact on the completion of the Milestone Dates; nor shall any extension of time be granted for delays to parts of the Work that are not located on the critical path. The Contractor acknowledges and agrees that an excusable delay in a portion of the Work or schedule activity does not necessarily result in a delay of equal duration in the completion of the entire Project.

§ 15.1.8 Direct Negotiation. Any dispute arising at any time during or after the construction of the Project shall be resolved, if possible, by negotiations between duly authorized representatives of the Contractor and the Owner. If such duly authorized representatives are unable to resolve any dispute within ten (10) days after written notice of such dispute together with all relevant supporting documentation is given by either party to the other, the matter may be submitted by either party to the dispute resolution process set forth below.

§ 15.2 INITIAL DECISION
§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker’s sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision
Manner in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION
§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of a civil action but, in such event, mediation shall proceed in advance of such civil action, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 LITIGATION AND ARBITRATION
§ 15.4.1 Any dispute that is not resolved by negotiation or mediation or arbitration shall be resolved by litigation in state or federal court. Contractor assents to jurisdiction in the state or federal courts of New Hampshire and agrees that the sole venue of any litigation between Contractor and Owner shall be Hillsborough County, New Hampshire. To the extent, the parties have agreed in the Owner-Contractor Agreement that claims below a certain dollar threshold shall be decided by binding arbitration, such arbitration shall be conducted and the arbitrator(s) selected in accordance with the Construction Industry Rules of the American Arbitration Association then pertaining unless the parties mutually agree otherwise.
Additions and Deletions Report for
AIA® Document A201™ – 2007

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for the following PROJECT:

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Master Owner Document SOREV 1-5-12

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(Name, legal status (Name and address)
COLLEGE
ADDRESS

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(Name, legal status (Name and address)

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The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be regarded as the documents, unless they are notified in section 3.18, nothing contained in the Contract Documents shall be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, or (3) by the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.
§ 1.1.9 NUMBER AND GENDER
The pronouns "they," "them," and "their" are used with a singular antecedent that is indefinite or that does not specific gender, in lieu of the masculine singular and feminine singular pronouns "he," "she," "him," "her," "his," and "her," and accordingly "they," "them," and "their" may be singular or plural depending on their antecedents and the context.

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. All Work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of this Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others.

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§ 1.2.4 In the event of conflicts or discrepancies among the Contract Documents, the documents shall be interpreted on the basis of the following priorities: First: Modifications or Change Orders to the Contract Documents, those of later date having precedence over those of earlier date; Second: the Agreement between Owner and Contractor; Third: these General Conditions as modified; Fourth: Addenda to Specifications and Drawings, with later date having greater priority; Fifth: Specifications and Drawings.

Larger scale drawings shall take precedence over smaller scale drawings. Should Drawings or the Specifications disagree in themselves or with each other, the Contractor shall provide the better quality or greater quality of the Work unless otherwise directed by written addendum to the Contract.

§ 1.2.5 All indications or notations which apply to one of the number of similar situations, material or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents.

§ 1.2.6 Where codes, standards, requirements and publications of public and private parties are referred to in the Contract Documents, references shall be understood to be to the latest revision prior to the date bids are received or negotiations are concluded, except otherwise indicated.

§ 1.2.7 All manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the manufacturer's written or printed directions and instructions unless otherwise indicated.

§ 1.2.8 Where the Work is to fit with existing conditions or Work to be performed by others, the Contractor shall fully and completely join the Work with such conditions or Work, unless otherwise specified.

§ 1.2.9 Exact locations of fixtures and outlets shall be obtained from the Architect before the Work is roughed in. Work installed without such information from the Architect shall be relocated at the Contractor's expense.

§ 1.2.10 Existing condition plans and information included with the Contract Documents or otherwise made available to the Contractor were obtained by the Owner for use by the Architect in the design of the Project. The Owner does not hold out such information to the Contractor as an accurate or approximate indication of subsurface conditions, and no claim for extra cost or extension of time resulting from a reliance by the Contractor on such information shall be except allowed as provided in Section 3.7.4.

§ 1.2.11 Where no explicit quality or standards for materials or workmanship are established for Work, such Work is to be consistent with the quality of the preceding Work and of the construction of the Project generally.

§ 1.2.12 Certain drawings (including mechanical, electrical and fire protection drawings) are diagrammatic only, and are not intended to show the alignment, physical locations or configurations of such Work. Such Work shall be...
installed without additional cost to the Owner to clear all obstructions, permit proper clearances for the Work of other trades, and present an orderly appearance where exposed. Prior to beginning such Work, the Contractor shall prepare coordination drawings showing the exact alignment, physical location and configuration of the components of the mechanical, electrical, and fire protection and other allied systems and demonstrating to the Architect's satisfaction that the installation of such systems will comply with the preceding sentence. The Contractor shall be solely liable and responsible for any such costs and/or delays resulting from the Contractor's failure to coordinate such installations.

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or articles, (3) the titles of other documents published by the American Institute of Architects, Architects, or (4) defined elsewhere in the Contract Documents.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein. Intentionally omitted.

... 

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall, with the Contractor's cooperation when requested, secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall endeavor to furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. The Owner does not hold out such information to the Contractor as accurate, and no claim for extra cost or extension of time resulting from a reliance by the Contractor on such information shall be allowed except as provided in section 3.7.4.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness after receipt from the Contractor of a written request for such information or services. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2. The Contractor shall arrange for the reproduction of the additional Contract Documents as necessary, and the cost of such reproduction shall be included within the Contract Sum. The Owner shall cause the Architect to deliver electronic files with the Drawings to the Contractor which can be used by the Contractor to print additional sets (subject to any reasonable conditions imposed by the Architects).
§ 2.5 Extent of Owner Approval or Consent
Owner is relying on the Architect to exercise the appropriate standard of care in connection with the design of the Work and the Contractor for execution of the Work, including all construction means, methods and techniques. Notwithstanding anything else set forth in the Contract Documents, any "approval" or "consent" by Owner in the context of the design of the Work means only approval of programmatic and/or aesthetic design intent. In the context of execution of the Work, "approval" by Owner of schedules and/or work plans means that the Owner acknowledges such activities or events for purposes of timing or coordination only.

§ 2.6 Owner-Furnished Materials, Equipment or Fixtures
If the Contract Documents require that, as part of the Work, that Contractor shall install or incorporate into the completed construction materials, equipment or fixtures furnished by Owner, Contractor's obligations under this agreement extend to such materials, equipment and fixtures on the same basis as the rest of the Work. Contractor's obligations to correct defective or non-conforming Work extends to and includes any and all materials, equipment, and fixtures furnished by Owner and to the installation thereof by the Contractor and the Subcontractors as fully as if such products had been purchased directly by Contractor or a Subcontractor for incorporation into the Work. The Contractor acknowledges that it has received and approved all information and specifications for any such Owner-furnished products sufficient so as to permit the Contractor to make this agreement. Such specifications for Owner-furnished materials, equipment or fixtures shall be considered a part of the Contract Documents and such items, upon delivery to, and acceptance by, Contractor, shall become a part of the Work.

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§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents. Before starting the Work, and at frequent intervals during the progress thereof, the Contractor shall carefully study and compare the Contract Documents with each other and with the information furnished by the Owner pursuant to section 2.2 and shall at once report to the Owner's Designated Representative any error, inconsistency or omission the Contractor may discover. Any necessary change shall be ordered as provided in Article 7, subject to the requirements of section 1.2 and other provisions of the Contract Documents. If the Contractor proceeds with the Work without such notice to the Owner's Designated Representative, having discovered such errors, inconsistencies or omissions, or if by reasonable study of the Contract Documents the Contractor should have discovered such, the Contractor shall bear all costs arising therefrom.

§ 3.2.1.1 The Drawings are generally drawn to scale; however, the figured dimensions or notes thereon shall govern. Before ordering any materials or doing any Work, the Contractor and each Subcontractor shall verify all measurements at the building site, and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of differences between the actual measurements and the dimensions indicated on the Drawings, except to the extent such differences are attributable to errors and omissions in the Contract Documents prepared by the Architect of which the Contractor is not aware (unless the Contractor should have been aware of such errors and omissions in connection with its exercise of the standard of care exercised by a reasonable contractor experienced in the type of work required) and for which correction would constitute a material change in the Work per the process set forth in Section 7.1.4 below. All differences which may be found shall be reported in writing to the Architect for consideration before proceeding with the Work. The Contractor shall give the Architect timely notice of any additional Drawings, Specifications, or instructions required to define the Work in greater detail, or to permit the proper progress of the Work.

§ 3.2.1.2 The Contractor shall not proceed with any Work not clearly and consistently defined in detail in the Contract Documents, but shall request additional Drawings or instructions from the Architect. If the Contractor proceeds with
such Work without obtaining further Drawings, Specifications, or instructions, the Contractor shall correct Work performed incorrectly at the Contractor's own cost and expense.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require. Intentionally omitted.

§ 3.2.4 If the Contractor believes that additional costs or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, Section 3.2.2, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, Section 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

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§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures (including all safety precautions and programs) and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof, and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall (a) give timely written notice to the Owner and Architect of the specific means, methods, techniques or procedures referred to in the Contract Documents that the Contractor believes are not safe or suitable; (b) participate in discussions with the Owner and the Architect regarding the specific means, methods, techniques or procedures referred to in the Contract Documents that the Contractor believes are not safe or suitable and (c) shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures, and accepts the terms of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner required means, methods, techniques, sequences or procedures. The Owner, the Architect and the Contractor have agreed upon specific means, methods, techniques or procedures that the Contractor agrees are safe and suitable for the Work. The Contractor shall remain solely responsible for and have control over the means, methods, techniques or procedures that are employed by the Contractor for the Work, notwithstanding that such construction means, methods, techniques, sequences or procedures are (i) referred to, indicated or implied by the Contract Documents or (ii) agreed to by the Architect or Owner. In no event shall the Contractor employ construction means, methods, procedures and techniques that violate (c) requirements of any warranties applicable to the Work or (y) laws, ordinances, regulations, rules and orders which bear upon the Contractor's performance of the Work.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors. Nothing contained in this section shall alter the relationship between the Contractor and each Subcontractor under the applicable subcontract with respect to each such Subcontractor's obligation for safety for persons or property.

...

§ 3.3.4 The Contractor shall coordinate and supervise the Work performed by Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade, as a result of improper coordination or supervision, causes delay to the general progress of the Work. The Contractor and all Subcontractors shall at all times afford each trade, any separate contractor, or the Owner, every reasonable opportunity for the installation of Work and the storage of materials.
§ 3.3.5 The Contractor shall arrange for and attend job meetings with the Owner and the Architect and such other persons as the Architect or Owner may from time to time wish to have present. The Contractor shall be represented by a principal, project manager, general superintendent or other authorized main office representative, as well as by the Contractor's own superintendent. An authorized representative of any Subcontractor or lower tier subcontractor shall attend such meetings if the representative's presence is required by the Owner or the Architect. Such representatives of the Contractor and the Subcontractors shall be empowered to making binding commitments on all matters to be discussed at such meetings, including costs, payments, change orders, time schedules and manpower. Any notices required under the Contract may be served on such representatives.

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. The word "provide" shall mean furnish and install complete, including connections, unless otherwise specified.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive. If the Contractor desires to substitute a product or method in lieu of what has been specified or shown in the Contract Documents, the Contractor may propose to do so in a written request to the Architect setting forth the following: (1) full explanation of the proposed substitution and submittal of all supporting data including technical information, catalog cuts, warranties, test results, installation instructions, operating procedures, and other like information for the original specified item and the proposed substitution as necessary for a complete evaluation of the substitution; (2) reasons why the substitution is advantageous or necessary, including the benefits to the Owner and the Work in the event the substitution is acceptable; (3) the adjustment, if any, in the Contract Sum in the event that substitution is acceptable; and (4) the adjustment, if any, in the Contract Time in the event that substitution is acceptable. Proposals for substitutions shall be submitted to the Architect, with a copy to the Owner, not later than 30 days prior to the time such substitute product or method would be incorporated in the Work or, if to be used or incorporated within 30 days of the commencement of the Work, immediately upon execution of the Agreement. No substitutions will be considered or allowed without the Contractor's submittal of complete substantiating data and information as stated herein. Approval of a proposed substitution shall be at the sole discretion of the Owner (after consulting with the Architect).

§ 3.4.2.1 By making a request for substitution, the Contractor: (1) represents that the Contractor has investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified; (2) represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified; (3) certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and (4) will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.

§ 3.4.2.2 The Contract Documents are intended to produce a build-out of consistent character and quality of design. All components of the building, including visible items of mechanical and electrical equipment, have been selected to have a coordinated design in relation to the overall appearance of the building. The Architect shall judge the design and appearance of proposed substitutes as to their suitability in relation to the overall design of the Project, as well as for their intrinsic merits. The Architect will not approve as equal to materials specified proposed substitutes which, in the Architect's opinion, would be out of character, obtrusive, or otherwise inconsistent with the character and quality of design of the Project. In order to permit coordinated design of color and finishes, the Contractor shall, if required by the Architect, furnish the substituted material in any color, finish, texture, or pattern which would have been available from the manufacturer originally specified, at no additional cost to the Owner.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfrt persons or persons not properly skilled in tasks assigned to them. The Owner may require removal of any workers from the Project that it deems unfit or not beneficial to the Project. The Owner reserves the right to require the Contractor to perform a background check.
of any worker employed by the Contractor or any of its subcontractors. If so request, the Contractor shall perform the background check to the Owner's satisfaction and shall provide the results to the Owner within a reasonable time period established by the Owner.

§ 3.4.4 All manufactured materials shall be ordered to be delivered in the manufacturer's original, unbroken packages, containers or bundles, bearing the name of the manufacturer and brand name of other designation, and all materials shall be handled, stored, installed, cleaned and protected in accordance with the manufacturer's directions, unless otherwise indicated in the Contract Documents.

§ 3.4.5 Any product, material or equipment specified in the Contract Documents by reference to the number, symbol or title of a specified standard, such as a commercial standard, federal specification, trade association standard, or other similar or related construction industry standard, shall comply with requirements in the latest revision thereof as of the date the Owner and the Contractor execute the Agreement.

§ 3.4.6 In all cases in which a manufacturer's name, trade name or other property designation is used in the Contract Documents in connection with a material, equipment or product to be furnished thereunder, the Contractor shall furnish the material, equipment or product of the named manufacturer(s) unless a written request for substitution is made in accordance with section 3.4.2 and the substitution is approved in writing by the Owner.

§ 3.4.7 The Contractor and all Subcontractors shall make all provisions necessary to avoid any disputes with labor unions and shall be responsible for any delays, damages or extra costs incurred as a result of such disputes. The Contractor shall be responsible for the maintenance of harmonious labor relations among its employees and the employees of its Subcontractors in such manner as will provide for harmony as far as practical among workers at the Project site. Prior to contracting with any Subcontractor, the Contractor will require such Subcontractor to certify its willingness to cooperate with not only the other Subcontractors hired by the Contractor, but also with the Owner, Architect, any other contractors hired by the Owner, and their subcontractors. Any Subcontractor not cooperating shall, at the Owner's reasonable discretion, be dismissed by the Contractor and a qualified replacement subcontractor shall be hired at the Contractor's expense.

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§ 3.5.2 The Contractor shall be responsible for determining that all materials furnished for the Work meet all requirements of the Contract Documents. The Architect may require the Contractor to produce reasonable evidence that materials used meet such requirements, such as certified reports or past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of the Architect, would lead to a reasonable certainty that any material used, or proposed to be used, in the Work meets the requirements of the Contract Documents. All such data shall be furnished at the Contractor's expense.

§ 3.5.3 The warranty provided in this section 3.5 shall be in addition to and not in limitation of any other warranty required by the Contract Documents or otherwise provided by law.

§ 3.5.4 The Contractor hereby assigns to the Owner, effective at the time of Substantial Completion of the Work, any and all manufacturer's warranties required by the Contract Documents relating to materials and labor used in the Work and further agrees to perform the Work in such manner so as to preserve all such manufacturer's warranties.

§ 3.5.5 The Contractor shall procure and deliver to the Architect, prior to final payment, all special warranties required by the Contract Documents. Delivery by the Contractor shall constitute the Contractor's guarantee to the Owner that the warranty will be performed in accordance with its terms and conditions.

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper
execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded. The Contractor shall apply for required licenses, permits, inspections and/or approvals sufficiently in advance of the time required to allow the Contractor and/or the Architect to respond to any municipal comments, conditions or requests (including, without limitation, changes to the Work) without delaying the progress of the Work.

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§ 3.7.6 The Contractor shall be responsible for familiarizing itself with the regulatory requirements governing the disposal of material, including material containing pollutants, from the site. The Owner will not recognize claims for additional disposal costs that could reasonably have been anticipated at the time of bidding.

... .1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

... .3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection. The Owner may require the Contractor to provide additional supervision to assist the superintendent when Owner determines the workload requires it.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed. The Contractor shall remove the superintendent if requested to do so in writing by the Owner, and shall promptly replace him with a competent person reasonably acceptable to the Owner.

§ 3.9.4 The superintendent shall keep a daily log of the progress of the Work and make it available to the Owner at all times. A copy of the log shall be submitted to the Owner upon completion of the Project. Additionally, daily field reports recording work activities, labor force and other information as required by the Owner shall be prepared daily by the Contractor and each subcontractor and submitted to the Owner.

§ 3.9.5 The Contractor shall furnish to both the Owner and the Architect the names, addresses and telephone numbers of the project manager, the superintendent, the superintendent's immediate supervisor, the superintendents of all subcontractors, and at least two other of their and their subcontractor's authorized representatives, indicating where they can be contacted at times other than normal working hours in case of emergency.

§ 3.9.6 The Contractor's superintendent shall not be assigned to, or become involved in, any project other than that of this Contract. He/she shall remain in attendance at the site, and, except for illness or other reason excusable to the Owner, shall be present at all times when Work of any kind is being done, including Work done during overtime. If absent for illness or other reason excusable to the Owner, a replacement having full authority and responsibility of the full-time superintendent shall be provided.
§ 3.10.1 The Contractor, promptly after being awarded the Contract, or in the case of a GMP as part of the GMP Proposal, shall prepare and submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work. The schedule Work (the “Schedule”). The Schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.1.1 The Schedule shall utilize the Critical Path Method of scheduling within a format acceptable to the Owner and shall be submitted in digital and hardcopy (paper or vellum) formats. The Schedule shall be developed with and shall be subject to approval by the Owner and shall: (i) comply with and include any the Milestone Dates required by the Contract Documents, including but not limited to Substantial Completion and Final Completion for each phase of Work, along with any other Milestone Dates as required by the Owner; (ii) show the Contractor’s overall approach to the planning, scheduling, and execution of the Work, including schedule activities for all Work components (“Activities”). Notice to Proceed, procurement of permits, shop drawing submittals, review and approval, anticipated design submittals, material and equipment procurement and delivery, third party interfaces (e.g., utility work); and closeout and commissioning; (iii) include only Activities with durations equal to or less than ten (10) calendar days; (iv) include logic relationships between Activities reflecting the Contractor’s as-planned sequencing of Work; and (v) identify any planned overtime.

§ 3.10.1.2 The Contractor shall monitor the progress of the Work for conformance with the requirements of the Schedule and shall promptly advise the Owner of any actual delays or potential delays. The Contractor shall deliver a written report to the Owner each month (or more frequently if requested by the Owner or the Architect) setting forth the actual progress of the Work and highlighting discrepancies between the actual progress of the Work and the Schedule (such updates are sometimes referred to in these General Conditions as “Progress Reports”). In the event any progress report indicates delays in achievements of any Milestone Date, the Contractor shall propose in written form an affirmative plan (the “Corrective Plan”) to correct the delay, including overtime, re-sequencing of Work and/or additional labor, if necessary, which Corrective Plan shall indicate the date by which the progress of the Work will comply with the Schedule, and shall be subject to the approval of the Owner. In no event shall any progress report or Corrective Plan constitute an adjustment in the Schedule, Contract Time or any Milestone Date unless any such adjustment is agreed to by the Owner and authorized pursuant to a Change Order.

§ 3.10.1.3 In the event (i) that the performance of the Work as of a Milestone Date has not progressed or reached the level of completion required by the Schedule, and (ii) the Contractor fails to submit a Corrective Plan that is approved by the Owner or the progress of the Work is not brought back into compliance with the Schedule on the date proposed by an approved Corrective Plan, the Owner shall have the right to order the Contractor to take corrective measures to expedite the progress of the work, including, without limitation, (1) supplying additional shifts or overtime, (2) supplying the additional manpower, equipment, and facilities, (3) re-sequencing of Work, and (4) other similar measures (hereinafter referred to collectively as “Extraordinary Measures”). Such Extraordinary Measures shall continue until the progress of the Work complies with the stage of completion required by the Contract Documents. The Owner’s right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor’s compliance with the Schedule. The Contractor shall not be entitled to an adjustment in the Contract Sum in connection with Extraordinary Measures required by the Owner under or pursuant to this Section 3.10.1. The Owner may exercise the rights furnished the Owner under or pursuant to this Section 3.10.1 as frequently as reasonably necessary to ensure that the Contractor’s performance of the work complies with the Schedule.

§ 3.10.1.4 In conjunction with the monthly Schedule submission, the Contractor shall draft and submit to the Owner a narrative explaining in detail all changes to the previous Schedule, lack of progress, delays, slippage or accelerations. The Owner at any time may require the Contractor to develop and submit an additional written mitigation plan based on feasible field actions that shall address and correct such delays, progress impediments, schedule slippage or missed Milestone Dates.
§ 3.10.1.5 Float or slack time associated with any one chain of activities is defined as the amount of time between the earliest start date and the latest start date or between the earliest finish date and the latest finish date for such activities, as set forth in the Schedule required under this Agreement, including any revisions or updates thereto. The Owner shall retain all beneficial rights to all schedule float including that resulting from any scheduled or actual completion in less than the Contract Time. The Contractor shall in no way be entitled to any compensation for any Claims for interference with or denial of an "early finish" or "early completion" of the Work. Extensions of time for performance will be granted only to the extent that the equitable time adjustments for the activity or activities affected exceed the total float along the activity chain involved at the time the change was ordered or the delay occurred. Notwithstanding the above, the Contractor shall only be entitled to an extension of time for an excusable delay to the critical path of the Work.

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The Contractor shall maintain at the site for the Owner one original copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate record field changes and selections made during construction and one construction (the "As-built Documents"), and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed. The markups to the As-Built Documents shall consist of record information including: (i) deviations from the Drawings made during construction; (ii) details in the Work not previously shown; (iii) changes to existing conditions or existing conditions found to differ from those shown on the Drawings; (iv) the actual installed position of equipment, piping conduits, light switches, electric fixtures, circuiting, ducts, dampers, access panels, control values, drains, openings, and stub-outs; and (v) such other information as the Owner may reasonably request. The Architect and/or the Owner's Representative (a) make routine edits and updates to the Drawings prepared by or on behalf of the Architect that are normal in the course of construction administration at mutually acceptable times during construction of the Project and (b) deliver such updated Drawings to the Contractor (in printed and electronic form) for use by the Contractor in preparing the Record Documents (subject to any reasonable conditions imposed by the Architect or Owner's Representative). Upon completion of the Work, the Contractor shall deliver to the Architect the marked As-Built Documents and reproducible transparencies thereof. Approval by the Architect, Owner's Representative, and the Owner of As-Built Documents prepared by the Contractor and its Subcontractors and suppliers shall be a condition precedent to the Owner's obligation to make final payment to the Contractor. The Contractor shall also deliver to the Architect all operations manuals for equipment as a condition precedent to final payment by Owner.

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§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. The accuracy of all such information is the responsibility of the Contractor. In reviewing Shop Drawings, Product Data, Samples, and similar submittals, the Architect shall be entitled to rely upon the Contractor's presentation that such information is correct and accurate.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect. The portions of the Work that are the subject of the approved submittal shall be completed in accordance with such approved submittal.

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§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions. Unless such written notice has been given, the Architect's approval of resubmitted Shop Drawings, Product Data, Sample, or similar submittal shall not constitute approval of any changes not requested on the prior submittal.
The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment or right of possession of the premises and the improvements made thereon by the Contractor shall remain at all times in the Owner. The Contractor’s right to entry and use thereof arises solely from the permission granted by the Owner under the Contract Documents. The Contractor shall confine the Contractor’s apparatus, the storage of materials, and the operations of the Contractor’s workers to limits indicated by law, ordinances, the Contract Documents and permits and/or directions of the Architect and/or the Owner and shall not unreasonably encumber the premises with the Contractor’s materials. The Owner shall not be liable to the Contractor, Subcontractors, their employees or anyone else with respect to the condition of the premises. The Owner shall have the right to refuse admittance to the site to any agent or employee of the Contractor or Subcontractors whose presence the Owner deems hostile to the Owner’s interest.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor’s consent to cutting or otherwise altering the Work. Existing work that is cut, damaged, disturbed or otherwise interfered with by the Contractor, a Subcontractor, or anyone for whom they are responsible shall be fully, properly and carefully repaired by the responsible Contractor or Subcontractor. All such repairs shall be completed in a first-class manner to the satisfaction of the Architect, and shall match similar existing adjoining work.

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials from and about the Project. Immediately prior to the Architect’s inspection for Substantial Completion, the Contractor shall completely clean the premises. Concrete and ceramic surfaces shall be cleaned and washed. Resilient coverings shall be cleaned, waxed and buffed. Woodwork shall be dusted and cleaned. Sash, fixtures and equipment shall be thoroughly cleaned. Stairs, spots, dust, marks and smears shall be removed from all surfaces. Hardware and all metal surfaces shall be cleaned and polished. Glass and plastic surfaces shall be thoroughly cleaned by professional window cleaners. All damaged, broken or scratched glass or plastic shall be replaced by the Contractor at the Contractor’s expense.

The Contractor shall provide the Owner and Architect safe access to the Work in preparation and progress wherever located.

§ 3.18.1 To the fullest extent permitted by law the Contractor shall defend (with counsel reasonably satisfactory to Owner), indemnify and hold harmless the Owner, Architect, Architect’s consultants, its lenders and affiliates, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused caused in whole or in part by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that which would otherwise exist as to a party or person described in this Section 3.18.
§ 3.19 LIENS

§ 3.19.1 In the event that any Subcontractor, supplier or any other party for whom the Contractor is responsible establishes a lien against the Work and/or the Project site, the Contractor shall, within five days of receipt of notice from the Owner regarding such lien, cause the lien to be discharged (either by obtaining and recording a lien discharge bond from a surety and in a form acceptable to the Owner or otherwise) at no cost to the Owner, except to the extent that the lien is directly and solely attributable to a failure by the Owner to pay undisputed amounts to the Contractor as and when due under the Contract Documents. If the Contractor fails to cause the lien to be discharged within such five day period, the Owner shall have the right to withhold all further payments to the Contractor until the lien is discharged. The Owner may either (a) apply amount so withheld to discharging such lien or (b) retain such amounts until such lien is discharged or released by the Contractor or the lienor, and shall thereafter credit to the Contractor any amounts remaining after payment of the fees and expenses the Owner incurs in connection with such lien. The Contractor agrees to indemnify and hold harmless the Owner from all costs and expenses incurred by the Owner in connection with such liens. For purposes of this Section 3.19.1, the term "lien" shall mean any instrument filed with the applicable land title records which creates or perfects a lien under any lien law.

§ 3.20 PROTECTION FROM WATER DAMAGE

§ 3.20.1 In performing the Work, the Contractor shall exercise diligent efforts to protect the building and to cause all materials, supplies, systems and equipment which are delivered to the Project site from exposure to, and damage from, water. Without limiting the generality of the foregoing, the Contractor shall (a) install temporary barriers adequate to prevent water entry to the building from openings in the roof, exterior walls or other applicable building elements to the extent related to the Work, (b) cause all materials, supplies, systems and equipment which are delivered to the Project site to be stored in a safe and secure location, packaged in a watertight manner where possible, and stored in a manner which protects such items from inclement weather, the elements (including, without limitation, rain, snow and water damage) and other damage until such items are incorporated into the work, and (c) ensure that all plumbing components and exterior elements included within the Work are constructed and installed in accordance with the Contract Documents so as not to allow water leaks or penetration.

§ 3.20.2 In addition to (and not in limitation of) the indemnification obligations of Contractor set forth in Section 3.18 above, Contractor shall defend, indemnify and hold harmless the parties indemnified under Section 3.18.1 above, to the fullest extent permitted by law from all Claims arising out of or resulting from the failure of Contractor (or any subcontractor of any tier) to comply with the provisions of this Section 3.20. The foregoing indemnification shall include, without limitation, any Claim attributable to (i) bodily injury, sickness, disease or death arising out of or relating to, and (ii) the costs of any abatement, clean-up, removal and disposal (to the satisfaction of Owner) of, any mold, fungal growth, spores or the like which occurs at the Project site as a result of any failure by Contractor (or any subcontractor of any tier) to comply with the provisions of this Section 3.20.

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§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Final Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

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§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4-7.4 7.4 involving an adjustment in the Contract Sum or an extension of the Contract Time. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 7.4.8.

§ 4.2.12.1 The Architect may, as the Architect judges desirable, issue additional drawings or instructions indicating in greater detail the construction or design of the various parts of the Work; such drawings or instructions may be
effected by field order or other notice to the Contractor, and provided such drawings or instructions are reasonably
consistent with the previously existing Contract Documents, the Work shall be executed in accordance with such
additional drawings or instructions without additional cost or extension of the Contract Time. If the Contractor claims
additional cost or time on account of such additional drawings or instructions, the Contractor shall give the notice
provided in Article 15.

§ 4.2.13 The Architect’s decisions on matters relating to aesthetic effect will be final if consistent with the intent
expressed in the Contract Documents and the agreement of the owner.

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§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as
practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of
persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed
for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1)
whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the
Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall
constitute notice of no reasonable objection.

...
Ordinances, building codes, rules and regulations without any adjustment to the subcontract amount or time for performance.

§ 5.5 Contractor will require each Subcontractor to employ a competent superintendent or trade foreman who shall be in attendance at the Project site during the progress of Subcontractor's Work.

§ 6.1.1.1 Notwithstanding anything to the contrary, the Owner shall have the right to install fixed and loose furniture, furnishings, fixtures, data communications lines, equipment and other items during the Contractor's performance of the Work or portion(s) thereof. The Owner and the Contractor shall cooperate in scheduling and coordinating any such activities by or on behalf of the Owner. Any such installation or activities by or on behalf of the Owner shall not be deemed as acceptance of any part of any Work not completed in accordance with the Contract Documents.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12. Intentionally omitted.

§ 7.1.4 If, subsequent to execution of the Agreement, the Architect issues any proposal requests, supplemental instructions, sketches and other materials intended to further define, clarify or modify the Contract Documents (collectively, the "Supplemental Material") Contractor shall, within ten (10) days of receiving any Supplemental Material, notify the Architect and Owner's Representative in writing of any error, inconsistency or discrepancy that the Contractor discovers between the Supplemental Materials and the Contract Documents and indicate whether the Supplemental Material have any impact upon the Contract Sum and/or the Contract Time. Failure of the Contractor to provide such notice is hereby deemed to mean: (1) such Supplemental Materials are consistent with the Contract Documents; (2) do not require a change in the Contract Sum and/or Contract Time; and (3) Contractor is willing and able to perform all of the Work for the Contract Sum, and in accordance with all the requirements of the Contract Documents. If the Contractor notifies the Owner's Representative and Architect that it believes the Supplemental Materials are either inconsistent with the Contract Documents and/or represent added Work or will delay performance in accordance with the Project schedule, the Owner's Representative and Architect will review the Contractor's response and provide the Owner with recommendations for approval or disapproval, and the Owner shall have one or more of the following options:

(a) The Owner may direct the Architect to modify the Supplemental Materials to which the Contractor objects. The Contractor shall cooperate with the Owner, Owner's Representative and the Architect during the modification effort and shall make recommendations appropriate to correct such portions of the Supplemental Materials. The Architect shall submit to the Contractor the revised Supplemental Materials as approved by the Owner. The Contractor shall promptly reexamine such revised Supplemental Materials as described in Section 7.1.4.

(b) If, upon review of the Contractor's notice, the Owner (after consultation with the Architect and Owner's Representative) believes that the portion of the Work described therein does not constitute a material change in the Work, or disagrees as to the impact claimed by the Contractor to the Contract Sum or Contract Time, as applicable, the Owner may so advise the Contractor through the Owner's Representative or Architect. If such disagreement is not promptly resolved, the Work subject to disagreement shall be identified in a schedule (the 'Disputed Work Schedule'). Whenever possible, the Owner and the Contractor shall resolve items set forth in the Disputed Work Schedule confirming such resolution in Change Orders. Items in the Disputed Work Schedule that are not resolved by the Owner and the Contractor shall be subject to the dispute resolution procedures set forth in Article
15. During the pendency of such dispute resolution procedures, all items remaining in the Disputed Work Schedule shall be performed by the Contractor as required by the Contract Documents and a tentative adjustment shall be made to the Contract Sum to the extent of any undisputed aspect of the item. No adjustment shall be made to the Contract Sum for any disputed item or portion of an item. For each remaining item in the Disputed Work Schedule, the Contractor shall keep a specific, detailed accounting of the time and materials required to complete such item. Adjustments to the Schedule shall not be permitted on a tentative basis; or

(c) If upon review of such notice from Contractor, the Owner agrees that all or a portion of the Work therein entails the Contractor to Change Order and the Owner elects not to direct the Architect to modify the Supplement Materials, the Owner and the Contractor shall enter into a written Change Order providing for such agreed changes to the Contract Sum and/or Contract Time, as applicable.

§ 7.1.5 Unless otherwise agreed to by the Owner, the aggregate limitation on the amount of profit and overhead that the Contractor, each Subcontractor and any lower level subcontractors and suppliers can charge for Work performed pursuant to Change Orders and Construction Change Directives shall be as follows: (a) for the Contractor for Work performed by the Contractor's own forces, ten percent (10%) of the cost of the Work; (b) for the Contractor for Work performed by Subcontractors, five percent (5%) of the cost of such Work; (c) for each Subcontractor for Work performed by such Subcontractor's own forces, ten percent (10%) of the cost of such Work for overhead and for profit; and (d) for each Subcontractor for Work performed by lower tier subcontractors, five percent (5%) of the cost of such Work for overhead and for profit. This aggregate combined profit and overhead amount shall include all other markups and non-direct costs.

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§ 7.2.2 Unless expressly reserved therein, an executed Change Order shall constitute a final settlement of all matters relating to the change in the Work which is the subject of the Change Order, including, but not limited to, all direct and indirect costs associated with such change, any adjustments to the Contract Sum or GMP and any adjustments to the Schedule, Contract Time and/or Milestone Dates.

...
determining them arising from any Construction Change Directive. (a) the adjustment to the Contract Sum shall be the net increase or decrease in the Cost of the Work attributable to the Construction Change Directive plus mark-up per Section 7.1.5 and (b) the adjustment to the Contract Time shall be equal to the net increase or decrease (if any) in the time required to perform the entire Work attributable to the Construction Change Directive. As used in this Section, the term "Cost of the Work" for Contractor shall mean the Cost of the Work as defined in the Agreement and for Subcontractors as defined in Section 7.6 below. Any disagreement as to the determination of such items that are not resolved by the Owner and the Contractor shall be subject to the dispute resolution procedures set forth in Article 15 of these General Conditions of the Contract.

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§ 7.5 BACK-UP FOR CHANGE ORDERS
§ 7.5.1 Lump Sum Proposal: The Contractor, Subcontractor or lower tier subcontractor’s proposal covering the extra Work or change will be itemized for the various components or Work and segregated by labor, material, and equipment in a detailed format satisfactory to the Owner. Such format will include a material and labor quantity take-off and related pricing information and extensions (by drawing, if applicable). The Contractor will furnish his itemized lump sum proposal and the similarly detailed proposals of any Subcontractors, lower tier subcontractors or material suppliers.

§ 7.5.2 Time and Material: Should the Owner elect to have the extra Work or change performed on a time and material basis, and so notify the Contractor in writing, the Contractor, Subcontractor or lower tier subcontractor shall perform the Work in such manner. Records supporting the actual cost of the Work (as defined in the Section 7.6) performed must be kept and forwarded to the Owner’s representative. Such records include, but are not limited to, material tickets for all actual material used, daily time sheets itemizing workmen’s names and hours worked for all actual labor costs, and such other evidence as the Owner’s representative may reasonably request. Owner may require authentication of all time tickets and material tickets. If so requested, the failure to provide such authenticity may constitute a waiver of any right to payment of the Contractor, Subcontractor or any lower tier subcontractor for the extra Work or change performed.

§ 7.5.3 Unit Prices: The Contractor, Subcontractor or lower tier subcontractor’s proposal shall itemize the quantities of each item of Work for which there is an applicable unit price. The quantities must be itemized in relation to each specific Contract Drawing.

§ 7.6 ACTUAL COST OF THE WORK FOR SUBCONTRACTORS
§ 7.6.1 If performed on a time and material basis, the Actual Cost of the Work for a Subcontractor shall comprise the following elements:

§ 7.6.1.1 Direct Job Costs for Labor: The number of hours, hourly payroll cost, labor burden (as defined in 7.6.1.2) and extended totals for each item of Work to arrive at the cost for direct labor including working foremen. All other administration, clerical expense and supervision above the level of working foremen (such as general foremen, superintendent, project manager, etc.) shall be considered covered by the Subcontractor’s mark-up per Section 7.1.5.

§ 7.6.1.2 Labor Burden: The employer’s net actual cost of payroll taxes (FICA, SUTA, FUTA), net actual cost of union benefits, and net actual cost for workers’ compensation insurance, taking into consideration adjustments for experience modifiers, premium discounts, dividends, rebates, etc. Labor burden shall not be considered to include costs of commercial General Liability Insurance, auto insurance or umbrella insurance which shall be considered covered by the Subcontractor’s mark-up per Section 7.1.5.

§ 7.6.1.3 Direct Job Costs for Materials & Equipment: The quantity, price and extended totals for each item of Work to arrive at the costs of direct material and equipment. Appropriate amounts may be included for the rental of major equipment (defined as tools and equipment with individual purchase costs of more than $1,000) specifically needed to perform the extra Work or change. Use of small tools (defined as tools and equipment with individual purchase costs of less than $1,000) is considered covered by the mark-up percentage to be added to the direct cost of the extra work or change. Cost for construction equipment, shall be the lower of the total expected rental cost or ownership cost equivalent including transportation charges and all applicable taxes.

§ 7.6.2 If performed on a unit price basis, the Actual Cost of Work shall comprise the following elements:
§ 7.6.2.1 Unit prices are for Work complete, measured in place (i.e., actual quantity installed) and cover profit and all other costs and expenses of the Contractor, Subcontractor or lower tier subcontractor. Unit prices include, without limit, all conditions of the Contract and all general requirements such as layout, reproduction of Drawings and Specifications, testing and inspection, shop drawing and sample coordination, supervision (field and home office), small tools and expendable items, insurance, taxes, temporary facilities and services, including access and safety provisions, "as-built" drawings, and general and administrative overhead and profit.

§ 7.6.2.2 Unit Price Application: For unit price items, additions and deletions of like items shall be algebraically summed and then multiplied by the applicable unit prices.

§ 7.6.3 Any changes undertaken without the Architect’s or the Owner’s authorization will not be recognized as a basis for a Claim for extra cost at a later date. If the Contractor claims that any instructions or orders, whether oral, written, by drawings, or otherwise, involve extra cost or time, and such instructions or orders are not accompanied by a written acknowledgement by the Owner or the Architect that extra payment will be made or time extended, they shall promptly so notify to the Architect in writing and should not proceed with the Work until they have received a further written order to proceed, except in cases of emergency affecting life or property. No claim for extra cost or time on account of such instructions shall be valid unless the Contractor has so notified the Architect, before proceeding, that they claim extra cost and time and has received the further written order form the Owner’s representative to proceed.

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§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, area-wide labor disputes not directed expressly at Contractor or any Subcontractor, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor’s control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order Construction Change Directive for such reasonable time as the Architect may determine. The Contractor acknowledges and agrees that (a) no adjustments to the Contract Time shall be made unless the events described above shall have the effect of actually delaying completion of components of the Work on the critical path indicated in the Schedule and (b) adjustments to Milestone Dates and/or the Contract Time will be permitted in connection with any such delay only to the extent such delay (i) is not caused, or could not have been avoided, by the Contractor, (ii) could not be limited or avoided by the Contractor’s timely notice to the Owner of the delay, (iii) has an impact of at least one (1) day and (iv) has no concurrent or contributing cause for which the Contractor would not be entitled to an extension of the Contract Time. Notwithstanding anything to the contrary, the Contractor shall not be entitled to any extension in the Contract Time for delays in receiving required licenses, permits, inspections or approvals unless the Owner is required to provide or obtain such licenses, permits, inspections or approvals.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 45-15 and this section 8.3.2 through section 8.3.8 below. Contractor’s written Claim for extension of Contract Time shall be accompanied by detailed dates, correspondence, notices, and any other data which provides proof of the events which are the basis for the Claim, including a network analysis justifying the time extension. Said network analysis shall specifically detail the extension of the critical path of the Project caused by the events which underlie the time extension request.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents. Should the Contractor be delayed in the performance of the Work, the Contractor shall (a) notify the Owner and the Architect in writing within three (3) days following the event or occurrence causing such delay and (b) notify the Owner and the Architect of the estimated extent of the delay and the cost, if any, which may be incurred as result of the delay within twenty-one (21) days following the event or occurrence causing such delay. If the Contractor fails to so notify the Owner and the Architect, the Contractor shall be barred from asserting any claim for compensation, expense or damages with respect to such delay.
§ 8.3.4 No claim for delay shall be allowed on account of failure of the Architect to furnish Drawings, Specifications or instructions, or to return Shop Drawings or Samples until a reasonable period of time (but in any event not less than fifteen days or such longer period as may be agreed to among the Architect, the Contractor and the Owner) after receipt by the Architect of written demand for such instructions, Drawings, or Samples, and not then unless the Contractor shows that the Architect’s delay has materially interfered with the progress of the Work.

§ 8.3.5 Notwithstanding anything to the contrary in any of the Contract Documents, the Contractor acknowledges and agrees that no extension of time shall be granted on account of weather conditions except as provided for in this Section 8.3.5. A claim by the Contractor for an increase in the Contract Time on account of weather shall only be granted if all the following conditions are met: (1) the weather during any calendar month (or pro rata portions of partial months at the beginning and end of the Contract Time) is "abnormal," as defined below; (2) the Contractor demonstrates that such abnormal weather had the effect of delaying completion of components of Work on the critical path indicated in the Construction Schedule; and (3) such Claim is made by written notice. "Abnormal weather" shall, for purposes of this Section, be limited to circumstances in which adverse weather conditions significantly exceed those which have historically been encountered, or may reasonably be expected to be encountered, at the Project site.

§ 8.3.6 If any of the events described in this Section 8.3 of the General Conditions of the Contract entitle the Contractor to an extension of the Contract Time, the sole remedy of the Contractor shall be such extension of the Contract Time and the Contractor shall not be entitled to any adjustment of the Contract Sum, except as otherwise provided in the following sentence. If and to the extent that the Contract Time is extended by more than ten (10) business days solely on account of fault or neglect of the Owner or Architect, the Contract Sum shall be increased by the Contractor’s reasonable and verified additional direct and indirect costs of performing the Work to the extent directly and solely attributable to extensions of the Contract Time on account of the fault or neglect of the Owner or Architect in excess of ten (10) business days.

§ 8.3.7 The Owner and Contractor agree that it is the intent of the Contract Documents that the Contractor shall have responsibility to achieve Substantial Completion of the Work within the Contract Time with an adequate work force, irrespective of any labor dispute (other than those of general applicability not directed at the Project, the Contractor or anyone for whom the Contractor is responsible), including picketing at or near the Project site, whether or not the Contractor is the primary employer involved in the labor dispute or a neutral employer, and whether or not the Contractor has a collective bargaining relationship with the union(s) involved in the labor dispute. Notwithstanding anything to the contrary in any of the Contract Documents, the Contractor acknowledges and agrees that no extension of time shall be granted on account of a labor dispute (other than those of general applicability not directed at the Project, the Contractor, or anyone for whom the contractor is responsible).

§ 8.3.8 If the Contractor submits a progress report indicating, or otherwise expresses an intention to achieve, completion of the Work prior to any completion date required by the Contract Documents or expiration of the Contract Time, no liability of the Owner to the Contractor for any failure of the Contractor to so complete the Work shall be created or implied.

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The Contract Sum is stated in the Agreement and, including authorized adjustments, is the maximum amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents. The Contractor shall provide to the Owner, throughout the course of the Work, reports projecting the cash flow needs of the Contractor. This report shall be prepared and delivered monthly, projecting the anticipated needs for the balance of the Project.

... Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Owner and Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. Such schedule shall be revised if later found by the Architect to be inaccurate. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment. Each item in the schedule of values shall be exclusive of the Contractor’s Fee. The proper share of the Contractor’s Fee for each item shall be listed in a separate line or column.
§ 9.3.1 At least ten days before the date established in the Agreement for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2-9.2., for completed portions of the Work. The format and number of copies of such Applications for Payment shall be as directed by the Owner. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents. Each Application for Payment shall be accompanied by the following, all in form and substance satisfactory to the Owner: (i) a current Contractor’s lien waiver and duly executed and acknowledged sworn statement showing all Subcontractors and material suppliers with whom the Contractor has entered into subcontracts, the amount of each such subcontract, the amount requested for any Subcontractor and/or material supplier in the requested progress payment, together with similar sworn statements from all such Subcontractors and material suppliers; (ii) duly executed waivers of mechanics’ and material suppliers’ liens from all Subcontractors and, when appropriate, from material suppliers and lower tier Subcontractors establishing payment or satisfaction of payment of all amounts requested by the Contractor on behalf of such entities or persons in any previous Application for Payment; (iii) proof of compliance with insurance and surety provisions as outlined in this Agreement; (iv) an updated schedule that accurately reflects the current status of the Project; and (v) all information and materials required to comply with the requirements of the Contract Documents or reasonably requested by the Owner or the Architect.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders. Change Orders when such Construction Change Directives have set forth an adjustment to the Contract Sum.

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§ 9.3.4 Contractor shall maintain record drawings as required by the Contract Documents, including for the mechanical and electrical trades, and shall review and inspect such drawings on a monthly basis. Contractor shall, on a monthly basis provide to Owner written confirmation that the record drawings are current.

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... third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by Contractor, including subcontractor and/or supplier lien claims which have not been dissolved by bond or operation of law by the Contractor;

... repeated failure to carry out the Work in accordance with the Contract Documents.

... failure to maintain current record drawings.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor. Intentionally omitted.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law, sub-subcontractor, or vendor.
§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3, 9.6.4 and 9.6.5.

... If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven-fourteen (14) days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within seven-fourteen (14) days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven-fourteen (14) additional days’ written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor’s reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

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§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use and only minor items which can be corrected or completed without any material interference with the Owner’s use of the Work which remains to be corrected or completed. Further, the following items are required from the Contractor prior to the Owner’s issuing of the Certificate of Substantial Completion: (i) the Owner and Architect agree that the Project is ready for the use intended without any concurrent Work that will disrupt the Owner’s activities; (ii) the Owner and the Architect agree that the Work has been completed in accordance with the Contract Documents, specifications, plans, drawings and all Change Orders; (iii) all HVAC systems included in the Work are functioning in accordance with the Contract Documents and a satisfactory test and balance report for said systems has been received by the Architect; (iv) all life safety systems included in the Work are functioning in accordance with the Contract Documents; (v) receipt by the Architect of the list of all outstanding Work that shall become the Punch List; and (vi) receipt by the Owner of all required final certifications and/or approvals from the governmental authorities having jurisdiction over the Work.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof for which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents, Intentionally omitted.

... § 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project stage. Such partial occupancy or use may commence when or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them respective responsibilities of Owner and Contractor for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents been established in writing. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner’s property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Additions and Deletions Report for AIA Document A201™ – 2007. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1951, 1963, 1966, 1970, 1976, 1977, 1977 and 1977 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 16:37:04 on 10/18/2013 under Order No.0542214944_1 which expires on 07/11/2014, and is not for resale.

User Notes:
Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5) payment, (6) waivers of liens, in the form provided by the Owner, from the Contractor and all Subcontractors and suppliers who performed portions of the Work or supplied materials or equipment in connection with the Work, (7) the expiration of time within which any Contractor, Subcontractor or supplier could file a lien under law, (8) any other data establishing payment or satisfaction of obligations, such as receipts, releases, and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner—Owner, (8) to the extent that final certificates(s) of occupancy for the Project and the certificates of inspection and operating permits described in Section 13.5.4 are required by governmental authorities to use and occupy the Project as intended, and to the extent that such items were not delivered to the Owner as a condition to Substantial completion of the Work, the final certificate(s) of occupancy for the Project and the certificates of inspection and operating permits described in Section 13.5.4, (9) the As-Built Documents and reproducible transparencies thereof, in accordance with Section 3.1.1, (10) all special warranties required by the Contract Documents, endorsed by the Contractor and in a form reasonably acceptable to the Architect and the Owner, and (11) all manufacturers' catalogs, instructions, and other similar data, including the necessary graphic cuts, diagrams, value charts, and the like, covering all mechanical and manually operated devices furnished and/or installed in any permanent structure. All of the foregoing items shall be submitted to the Owner in a single binder (the "Project Binder"), and the Contractor shall submit to the Owner four (4) copies of the Project Binder. As an additional condition to be satisfied prior to final payment, the Contractor's personnel or Subcontractors' or suppliers’ personnel, as appropriate, shall provide the property management and operations personnel at the Property with training in the operation and maintenance of building systems and controls installed as part of the Work. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

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4. any Claim which has not been waived in accordance with this Agreement shall be deemed to have accrued upon discovery by the Owner of the condition or breach upon which such Claim is based, for the purpose of any applicable statute of limitation.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment and services, and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal. The area within the site limits, including all storage areas, shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site.

§ 10.2.9 The Contractor is responsible for maintaining the area within the site limits free of all debris and food-related trash that may harbor and/or attract rodents. The Contractor shall provide secure refuse containers for all food-related trash. The containers shall be heavy-duty refuse containers with tight-fitting domed lids, a spring loaded flap, and no opening that allow access by rodents. The Contractor shall notify the Owner immediately whenever rodents or signs of rodents (e.g., burrows, droppings) are observed.

§ 10.2.10 The Contractor shall at all times protect excavations, trenches, buildings and materials, from rain water, ground water, backup or leakage of sewers, drains and other piping, and from water of any other origin and shall remove promptly any accumulation of water. The Contractor shall provide and operate all pumps, piping and other equipment necessary to this end.

§ 10.2.11 The Contractor shall take reasonable precautions to prevent loss or damage caused by vandalism, theft, burglary, pilferage or unexplained disappearance of property of the Owner, whether or not forming part of the Work, located within those areas of the Project to which the Contractor has control.
§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

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§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions and normal and/or customary construction practices will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

Intentionally omitted.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances on site.

§ 10.3.4.1 Hazardous waste that is generated by the Contractor as part of the Work shall be stored and disposed of in accordance with all applicable Federal, State and local regulations. Hazardous waste storage requirements include, but are not limited to, secondary containment, proper labeling, segregation of incompatible materials and routing inspection of storage areas. In addition, all hazardous waste containers shall be constructed of a material that is compatible with the waste, shall be in sound condition, and shall be kept securely closed at all times.

§ 10.3.4.2 The Contractor is responsible for the proper removal and disposition of all surplus chemicals (e.g., paints, lubricants, cleaning products) that they bring on-site as part of the Work. The Contractor shall not use any drain, pipe or plumbing fixture for the disposal of any waste materials. No chemicals that the Contractor brings on-site shall remain on the Project site at the completion of the Work.

§ 10.3.4.3 To ensure that construction activities and the use of heavy equipment does not increase the risk of release of oil or hazardous materials to the environment, the Contractor shall have and implement a Spill Plan that reflects all regulatory standards. The Contractor shall immediately report all spills/releases to the Owner. The Contractor shall coordinate with the Owner regarding reporting and follow-up documentation to outside regulatory agencies.

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§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance outside the scope of its Work solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.3.7 Notwithstanding anything to the contrary, the Contractor acknowledges and agrees that the Work will likely require the removal and/or remediation of soil, debris and other items containing hazardous materials or contaminants to the extent disclosed in reports or materials previously delivered to the Contractor. All such Work shall be performed, and all such materials shall be removed and disposed of by qualified and licensed (where required) parties engaged by the Contractor in compliance with all applicable legal requirements.
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies acceptable to Owner and lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

1. Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;

2. Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

4. Claims for damages sustained by personal injury liability coverage;

5. Claims for damages other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

6. Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

7. Claims for bodily injury or property damage arising out of completed operations; and

8. Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18. Such insurance shall include, at a minimum, the following:

§ 11.1.1.1

The Contractor shall maintain the insurance coverages set out in this Section, insuring the Contractor and its employees, agents, and designees, which insurance shall be by policies that are subject to the Owner's approval:

a. Workers' Compensation Insurance to cover full liability under the Workers' Compensation laws of the state or jurisdiction in which the Project is located at the statutory limits required in said jurisdiction, including coverage for the benefits provided under United States Longshoremen's & Harbor Workers' Act, if applicable.

b. Employers' Liability Insurance (with limits of not less than $500,000 per accident for Bodily Injury by accident, $500,000 each employee - by disease and $500,000 policy limit - by disease), covering operations of the Contractor.

c. Commercial General Liability ("CGL") Insurance for operations of the Contractor with coverage written at least as broad as that of the standard Commercial General Liability Insurance policy (Occurrence Form) including hazards of operations (including explosions, collapse, and underground operations), with contractual liability coverage and personal injury liability coverage for claims arising out of this Agreement. The insurance required by this subsection (c) shall be written for not less than limits of liability as follows: $1,000,000 each occurrence for bodily injury and property damage; $2,000,000 general aggregate; and $2,000,000 aggregate products/completed operations. CGL coverage shall be written on ISO Occurrence Form CG 00 01 (10.01) or a substitute form providing equivalent coverage and shall cover liability arising from premises, operations, independent contractors, products, completed operations, and personal and advertising injury.

d. Automobile Liability Insurance covering all owned non-owned and hired automobiles, trucks, and trailers of the Contractor. Such insurance coverage shall be written at least as broad as that of the Standard Commercial Automobile Liability policy and shall be written for not less than a $1,000,000 limit of liability per occurrence for bodily injury and property damage.

e. Should aircraft or watercraft of any kind be used by Contractor, any tier of Subcontractor or by anyone else on their behalf, Contractor or Subcontractor shall maintain or cause the operator of the aircraft/watercraft to maintain Aircraft/Watercraft Public Liability Insurance including bodily injury, property damage, and passenger liability, with respect to any aircraft/watercraft owner, used, operated or hired in connection with the Work the Contractor, Subcontractor or anyone else written for not less than a $5,000,000 limit of liability per occurrence for bodily injury and property damage.

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f. Should the performance of this Agreement require the Contractor, any tier of subcontractor or anyone else on their behalf to conduct any activities in the vicinity of a railroad, the Contractor or Subcontractor shall maintain such Railroad Protective Insurance as may be required by the affected railroad written for not less than the limits required by such railroad. The Contractor's Railroad Protective Insurance shall be written on the policy form required by the affected railroad.

g. Excess or Umbrella Liability Insurance with coverage written at least as broad as those of the primary policies required by this Subsections 1 (b), (c), (d), and (e) above and written for not less than a $10,000,000 limit of liability per occurrence.

§ 11.1.1.2 Each insurance policy to be maintained under the prior Section, subparts 1 (b), (c), (d), (e), (f), and (g), shall be endorsed to name as Additional Insureds: the Owner, Owner's Representative, Architect and the trustees, directors, officers, agents, consultants, servants and employees of each of them and all other interests as may be reasonably required by the Owner. Such parties shall be included as Additional Insureds on the CGL and Umbrella using ISO Additional Insured Endorsement CG 20 10 (11 85) or CG 20 33 (10 01) AND CG 20 37 (10 01) or an endorsement providing equivalent coverage to the additional insureds. This insurance for the Additional Insureds shall be as broad as the coverage provided for the named insured. Such insurance shall apply as primary and non-contributing insurance before any other insurance or self insurance, including any deductible, maintained by, or provided to, the Additional Insured. If the Additional Insureds have other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis and apply to the Additional Insureds only. The amount of Contractor's insurance shall not be reduced by the existence of such other insurance. All Subcontractors shall provide endorsements naming the Contractor, the Owner, Owner's Representative, Architect, and any lenders of Owner and all other parties required by this Agreement as "Additional Insureds" on their CGL, and Umbrella policies using the same ISO forms or combinations of forms. Contractor and all Subcontractors shall maintain CGL and Umbrella coverage for themselves and all additional insureds for the duration of the Work and maintain Completed Operations coverage for themselves and the Additional Insureds for at least six (6) years after Substantial Completion of the Work.

§ 11.1.1.3 Prior to the date on which Contractor commences the performance of the Work, the Contractor shall cause to be furnished to the Owner the Certificate of Insurance for the coverages required by this Agreement to be maintained by Contractor with insurance carriers acceptable to the Owner. As and when the Owner may direct, copies of the actual insurance policies or renewals or replacements thereof shall be submitted to the Owner. All copies of policies, if any, and Certificates of Insurance submitted to the Owner shall be in form and content acceptable to the Owner. In the event Contractor maintains insurance with limits exceeding the limits required hereunder, the Certificate of Insurance shall state the full extent of the coverage available to the above Additional Insureds. Such excess liability coverage will inure to the benefit of the Additional Insureds in the event of loss in excess of the minimum insurance required herein. Contractor will obtain and maintain copies of Certificates of Insurance from all Subcontractors.

§ 11.1.1.4 Contractor shall require all policies of insurance that are secured and maintained by Contractor to include clauses providing that each carrier shall waive all of its rights of recovery, under subrogation or otherwise, against the Owner, Owner's Representative, Architect and their affiliates. In addition, Contractor waives all rights of recovery against the Owner, Owner's Representative and/or Architect it may have or acquire because of deductible clauses in or inadequacy of limits of any policies of insurance that are in any way related to the Work or activities of Contractor. Nothing contained herein shall relieve contractor from its obligations to exercise due care in the performance of its duties in under this Contract. If the Contractor fails to furnish and maintain the required insurance, the Owner may, at its option, purchase such insurance on behalf of the Contractor, and Contractor shall pay the cost thereof to the Owner upon demand and shall furnish to the Owner any information needed to obtain such insurance.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. Intentionally omitted.
§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness. These certificates shall set forth evidence of all coverage required by Section 11.1.1. The form of certificates shall be the ACCORD form. Contractor shall furnish to the Owner copies of any endorsements that are subsequently issued amending limits of coverage.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations. Intentionally omitted.

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§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss. The Owner's property insurance will not cover hoists, tools, or other equipment belonging to the Contractor or any Subcontractor.

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§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles unless such loss is due to the fault or neglect of Contractor or a party for whom Contractor is responsible.

... The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused, to the extent covered by insurance.

... § 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.5 Intentionally omitted...

...
§ 11.3.8 A loss insured under the Owner’s property insurance shall be adjusted by the Owner as fiduciary in good faith and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgage clause of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner’s duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7-Intentionally omitted.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner’s exercise of this power; and such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

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§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract. The cost of all bonds premiums shall be a cost of the work. If the construction manager requires bonding of subcontractors, this cost shall be noted as a separate cost item on the subcontractors bid and contract. The owner shall have the right to reject the bond cost for subcontractors as a cost of the work and require the construction manager to carry the cost as part of the base fee.

§ 11.5.1.1 In addition, should anyone claiming by, through or under Contractor assert a mechanic’s lien on the Project alleging non-payment for work, labor and materials or other similar claims regarding the Project, Contractor shall be obligated to obtain a bond pursuant to applicable law, or if acceptable to Owner, other lawful and satisfactory security, to discharge said lien and to clear the title of the Project.

... The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect’s services and expenses made necessary thereby, and any cost, expenses, loss or damages to the Owner resulting from such failure or defect, shall be at the Contractor’s expense.

§ 12.2.2.1 In addition to the Contractor’s obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor...
an opportunity to make the correction, the Owner waives the right to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4. This obligation under the Section 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work. This obligation under this Section 12.2.2 shall survive acceptance of the Work under the Contract and termination of the Contract.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

Intentionally omitted.

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If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable, but in such event, the Owner’s acceptance shall not be deemed a waiver of any other rights the Owner has hereunder. Such adjustment shall be effected whether or not final payment has been made.

... The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4 located.

...

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other; provided, however, that either party may assign this Agreement or any rights acquired hereunder without the other party’s consent if such assignment is to any corporation or entity which may hereafter become the party’s successor-in-interest or which purchases all or substantially all of the party’s assets. In the event an assignment is approved, the assignee must expressly assume all obligations and liabilities of the assignor hereunder, and such assignment will not relieve the assignor of its obligations hereunder. Any attempt at assignment without the consent of the other party as provided herein shall be deemed null and void and a material breach of this Agreement. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 Notwithstanding the foregoing, the Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner’s rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

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The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any event not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

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§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

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§ 14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed in place.

A Claim is a demand or assertion by one of the parties the Contractor seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term “Claim” also includes other disputes and matters in question between the Owner and by the Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.Contractor.

Claims by either the Owner or Contractor must be initiated by written notice to the other party containing a clear statement of the basis of the Claim and the relief sought by the Contractor, and such notice shall be provided to the Owner and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party the Contractor must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant Contractor first recognizes the condition giving rise to the Claim, whichever is later; provided that, in the case of a Claim based upon delay to the Contractor, as a condition precedent to any Claim, the Contractor shall first provide initial notice of a delay within 3 days of the event giving rise to the delay, and then provide a Claim within such 21 day period thereafter; and further provided, however, that the Contractor shall use its best efforts to furnish the Architect and the Owner, as expeditiously as possible, with notice of any Claim including, without limitation, those in connection with concealed or unknown conditions, once such Claim is recognized, and shall cooperate with the Architect and the Owner in an effort to mitigate the alleged or potential damages, delay or other adverse consequences arising out of the condition which is the cause of such a Claim. THE CONTRACTOR EXPRESSLY AGREES THAT FAILURE OF THE CONTRACTOR TO INITIATE A CLAIM WITHIN THE TIME LIMITS SPECIFIED IN THIS SECTION 15.1.2 SHALL RESULT IN SUCH CLAIM BEING WAIVED.

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments that are not in dispute in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

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If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein in Section 15.1.2 shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5.1 Contractor shall advise the Owner and Architect in writing of any known delay within three (3) days of its knowledge of the same (including delays in the receipt of drawings or designs from designer or Architect), and shall include an identification of the delay, its anticipated duration and its anticipated effect on the prosecution and completion of the Work. If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein in Section 15.1.2 shall be given. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary. The
Contractor shall have the burden of demonstrating the effect of the claimed delay on the Contract Time, and shall furnish the Owner and Architect with such documentation relating thereto as they may reasonably require. The Contractor shall take all prudent steps necessary to minimize the delay, and shall diligently proceed to complete the Work as required by the Contract Documents. Notwithstanding the foregoing, time for performance of a party's obligations hereunder shall not be tolled unless and until the party claiming such excuse has provided the other party with written notice of the event.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. Claims arising from adverse weather conditions shall be subject to the provisions of Section 8.3.5.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES: Intentionally omitted.

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

1. damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

2. damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

§ 15.1.7 No extension of time shall be granted to the Contractor for delays occurring to parts of the Work that have no measurable impact on the completion of the Milestone Dates, nor shall any extension of time be granted for delays to parts of the Work that are not located on the critical path. The Contractor acknowledges and agrees that an excusable delay in a portion of the Work or schedule activity does not necessarily result in a delay of equal duration in the completion of the entire Project.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.1.8 Dispute Resolution. Any dispute arising at any time during or after the construction of the Project shall be resolved if possible, by negotiations between duly authorized representatives of the Contractor and the Owner. If such duly authorized representatives are unable to resolve any dispute within ten (10) days after written notice of such dispute together with all relevant supporting documentation is given by either party to the other, the matter may be submitted by either party to the dispute resolution process set forth below.

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§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings a civil action, but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, such civil action, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.4 LITIGATION AND ARBITRATION

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded. Any dispute that is not resolved by negotiation or mediation or arbitration shall be resolved
by litigation in state or federal court. Contractor assents to jurisdiction in the state or federal courts of New Hampshire and agrees that the sole venue of any litigation between Contractor and Owner shall be Hillsborough County, New Hampshire. To the extent, the parties have agreed in the Owner-Contractor Agreement that claims below a certain dollar threshold shall be decided by binding arbitration, such arbitration shall be conducted and the arbitrator(s) selected in accordance with the Construction Industry Rules of the American Arbitration Association then pertaining unless the parties mutually agree otherwise.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER
§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.
Certification of Document's Authenticity
AIA® Document D401™ - 2003

I, Matthew Moore, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 16:37:04 on 10/18/2013 under Order No. 0642214944_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ - 2007, General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

() Title

(Dated)
## SECTION 23 00 00 – HEATING, VENTILATION AND AIR-CONDITIONING

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SECTION 23 00 00 – HEATING, VENTILATION AND AIR-CONDITIONING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Conditions of the Contract and Division 1, General Requirements, shall be made part of this Section.

B. Refer to the drawings for further definition of location, extend, and details of the work described herein.

C. Cooperate and coordinate with all trades in execution of the work described in this Section and so as to provide clearance for equipment maintenance operation.

D. Where referred to, standard specifications of technical Societies, Manufacturer's Associations, and Federal Agencies shall include all amendments current as the date of issue of these Specifications.

E. It is intended, for the guidance of the bidders, that the Manufacturer's name used first throughout this Section of the Specification, is that used in the design of the HVAC system. All material submitted shall be equal in all respects to that used in the design.

F. The Subcontractor for work of this Section shall become familiar with other Sections of the Specifications to determine the type and extent of work there under which affects the work of this trade, whether or not such work is specifically mentioned in this Section.

1.2 WORK INCLUDED

A. Provide all labor, equipment, and materials, required to furnish and install all HVAC work, complete as shown on the drawings and specified herein. The following are major items of work included:

1. Selective Demolition
2. Hoisting and rigging for equipment and materials specified herein.
3. Core drilling, cutting and channeling for holes five (5) inches and less in diameter.
4. Furnish and maintain in safe and adequate condition, all staging and scaffolding that is required for work of this section.
5. Maintain Proper Indoor Air Quality of building during construction.
6. Properly protect all stored and partially installed equipment, piping and ductwork.
7. Submittals and Coordination Drawings.
8. Equipment and Systems:
   a. Chilled water hydronic piping systems.
   b. Chillers.
   c. Chemical treatment systems.
   d. Piping Insulation
   e. Equipment Insulation
   f. Mechanical Identification
   g. HVAC Motor starters and interlocking devices
   h. Vibration isolation and Seismic Restraint
   i. Automatic Temperature Controls and all interlock wiring and monitoring
9. Fire Watch as required.
11. Testing, Adjusting and Balancing of all water systems.
12. System Demonstration/Start-up/Manufacturer Representation.
13. Houskeeping pads
14. Operations and Maintenance Manuals
15. Record Drawings

1.3 RELATED WORK

A. The following related items are included under sections listed below:
1. Except as specified herein, cutting shall be the responsibility of the General Contractor and patching shall be performed by the respective trades. Refer to the respective sections.
2. The HVAC Subcontractor shall provide all hoisting and rigging for equipment and materials specified herein.
3. Core drilling, cutting and channeling for HVAC equipment for holes five (5) inches and less in diameter.
4. Furnish and maintain in safe and adequate condition, all staging and scaffolding that is required for work of this section.
5. Fuel, water and electricity for all tests and temporary operation of HVAC equipment. – DIVISION 1 - TEMPORARY FACILITIES AND CONTROLS.
6. In general, all wiring required for equipment provided by the HVAC Contractor that requires Automatic Controls and all interlock wiring and accessories for this HVAC equipment that is not shown or indicated on the Electrical Drawings of DIVISION 26 - ELECTRICAL, shall be provided under DIVISION 23 – HEATING, VENTILATION, AND AIR CONDITIONING.
7. HVAC Motor Starters, Disconnects and Variable Frequency Drives provided under this section shall be installed under DIVISION 26 – ELECTRICAL.

1.4 INTENT

A. Description in the Specifications, or the indication on the Drawings of equipment, materials, operation and methods, required that such items shall be of the quantity required, and the systems complete in every respect.

B. The Specifications shall be considered an integral part of the accompanying Drawings. Any item or subject omitted from one or the other, but which is either mentioned or reasonably implied, shall be considered as properly and sufficiently specified. In the case of a conflict, the more demanding item shall apply.

C. The HVAC Contractor shall be completely responsible for the acceptable condition and operation of all systems, equipment and components forming part of the installation or directly associated with it. The HVAC Contractor shall provide fully qualified personnel to fulfill this requirement. The HVAC Contractor shall be responsible for prompt replacement of defective materials, equipment and parts of equipment and related damages.

1.5 STANDARD OF MATERIALS AND WORKMANSHIP

A. Refer to Division 1 for general instructions and, in addition, adhere to the following:
1. Workmanship and installation methods shall conform to the highest standard practice. Work shall be performed by skilled tradesmen under the direct supervision of fully qualified personnel.
2. Install equipment in strict accordance with manufacturer's published recommendations.

3. When requested, submit samples of materials proposed for review before proceeding with the work.

4. Install equipment and materials to present a neat appearance. Install piping, ducts and conduit parallel with or perpendicular to building planes.

5. Conceal piping, ducts and conduit in finished areas. Install work so as to require a minimum amount of furring.

6. Make provisions for neat insulation finish around equipment and materials. Do not mount piping or equipment within insulation depth.

7. Equipment, materials and work shall comply with the requirements of generally recognized agencies, including, but not limited to, agencies listed under DIVISION 23 – HEATING VENTILATION AND AIR-CONDITIONING Article STANDARDS- REFERENCES and shall conform to and be installed in strict accordance with Federal, State and Town requirements and shall meet all of the requirements of all authorities having jurisdiction.

1.6 ABBREVIATIONS AND DEFINITIONS

A. “HVAC” or “HV” or “AC” as mentioned herein means specifically “Heating, Ventilating and Air Conditioning” or “Heating and Ventilating” or “Air Conditioning” respectively, when used in conjunction with contractor, equipment, work or articles within this specification.

B. A.T.C. as mentioned herein means specifically Automatic Temperature Control as it refers to the manufacturer or description of work and equipment.

C. “Provide” may be used in place of “furnish and install” and where used shall mean to deliver, furnish, erect, and connect up complete in readiness for regular operation, the particular work or equipment referred to, unless otherwise specified.

D. “Concealed” shall be defined as areas where piping or ducts are located in chases, shafts, and above ceilings whether furred or lay-in type.
   1. All other ductwork and piping shall be considered “exposed”.

E. The term “Applicable Section Contractor” or “A.S.C.” shall be understood to refer to a contractor or contractors other than the HVAC Contractor or any HVAC Subcontractor or HVAC Sub-subcontractor.

1.7 EXAMINATION

A. Before submitting bid, visit and examine the site where work is to be carried out and become familiar with all features and characteristics which affect the work of this SECTION.

B. Examine the Specifications and Drawings, including the Specifications and Drawings of other DIVISIONS before bid.

C. Report in writing, any discrepancies or deficiencies which may adversely affect the work, at least six days prior to close of bid.

D. No allowance will be made for any difficulties encountered due to any features of the building, site or surrounding public and private property which existed up to the time of bid.

1.8 REFERENCES
A. All material and workmanship shall comply with all applicable codes, local and state ordinances, industry standards, and utility company regulations.

B. All materials, equipment and apparatus shall be Underwriters Listed or Labeled for all components where such listing or label are available. Items which are not UL Listed or Labeled are not acceptable if labeled or listed equipment can be obtained from another acceptable manufacturer. Assemblies or components not labeled or listed shall be furnished with certification by the manufacturer that the wiring complies with UL safety requirements.

C. STANDARDS: Except as modified by governing codes or this specification, the following applicable standards (latest editions regardless of years listed below) shall apply to materials, equipment and installation of components and systems furnished and/or installed as part of this Section:

1. ASHRAE – American Society of Heating, Refrigeration and Air-conditioning Engineers
   a. Special Attention is required for:

2. NEC – NATIONAL ELECTRIC CODE
3. OSHA – Occupational Safety & Health Administration
4. UL – Underwriter's Laboratory
5. EPA – Environmental Protection agency
6. AIA – American Institute of Architects
7. ANSI – American Nation Standards Institute
8. ASME – American Society of Mechanical Engineers
   a. Special Attention is required for:
      1) ASME B31.9, “Building Services Piping,” for materials, products, and installation. Safety valves and pressure vessels shall bear appropriate ASME label.

9. ARI – American Air Conditioning and Refrigeration Institute
10. IEEE- Institute of Electrical and Electronics Engineers
11. IPCEA – Insulated Power Cable Engineers Association
12. ADA –American Standards Association
13. FM – Factory Mutual Engineering Division
14. CS – Commercial Standard of NBS (US Department of Commerce)
15. NADCA - National Air Duct Cleaners Association – ACR 2006
16. NEMA – National Electrical Manufacturers Association
17. ASTM – American Society of Testing and Materials

D. CODES and ORDINANCES: Conform with the provisions of the latest editions of the following:

1. 2009 International Building Code
2. 2009 International Mechanical Code
4. State Amendments to International Codes
5. City/Town of Portsmouth fire protection codes and/or ordinances.
6. The State of New Hampshire Amendments to the Building Code

1.9 DRAWINGS
A. The Drawings are schematic in nature and are intended to show approximate locations of apparatus, fixtures, piping and duct runs in diagrammatic form. The Drawings are not intended to show Architectural and Structural details.

B. Do not scale drawings. Obtain any information requiring accurate dimensions from Architectural and Structural Drawings or from site measurements. Check locations and elevations before proceeding with work.

C. At no additional cost to the Owner, make all changes or additions to materials and/or equipment necessary to accommodate structural and architectural conditions.

D. Leave areas clear and unobstructed where space is indicated as reserved for future equipment.

E. Whether shown on the Drawings or not, provide adequate space and provision for servicing of equipment and removal and reinstallation of replaceable items such as motors, coils, filters and tubes.

F. Provide all ceiling mounted components, including air terminals, access doors and panels, in strict accordance with reflected ceiling plans.

1.10 FABRICATION OF MATERIALS

A. Before prefabricating ductwork or piping for installation, make certain that such items can be installed as shown on the coordination drawings without interfering with the structure or the work of other trades. Any problems that cannot be solved in agreement with other trades affected, shall be submitted for decision.

B. If ductwork or piping is prefabricated prior to the investigation and reaching of a solution to possible interference problems, necessary changes in such prefabricated items shall be made at not extra cost to the Owner.

C. In case of any discrepancies between the Specifications and Drawings, or where the Specifications or Drawings are not clear or definite, the subject shall be referred to or decided by the Architect whose decision shall be final. Otherwise, make adjustments at no expense to the Owner.

1.11 PERMITS, FEES, INSPECTION CERTIFICATES

A. Apply for, obtain and pay for all permits, inspections and fees required.

B. Be fully acquainted with and obey all Federal, State, and Municipal laws, by-laws, codes and regulations, and all authorities having jurisdiction. Provide fire dampers and smoke dampers in air handling systems as described herein.

C. Before starting any work, submit the required specifications and Drawings to the Governing Authorities for their approval. Comply with any requested changes as part of the Contract, and give any notification immediately of such changes.

D. Where the Specifications, Instructions, or the Governing Authorities require any work to be tested, inspected or approved, give sufficient notice of its readiness for inspection, and, if the inspection is by a Governing Authority, of the date and time set for such inspection.
E. Inspection will be made promptly. If any work is covered up without consent, it shall, if required, be uncovered for examination and the required corrections made at not extra cost to the Owner.

F. Furnish any certificates necessary as evidence that the work conforms to the requirements of all authorities having jurisdiction.

G. Make changes, if required, to make the work conform to all laws, bylaws, codes, and regulations, as part of this SECTION work.

1.12 RECORD DRAWINGS

A. Refer to DIVISION 1 – GENERAL REQUIREMENTS and DIVISION 1 - PROJECT CLOSEOUT.

B. All costs for Record Drawings shall be borne by the HVAC Subcontractor.

C. Purchase and maintain at the job site at all times, a complete set of blackline prints of the HVAC drawings. As the work progresses, mark all changes made, whether resulting from addenda, formal change orders or other instructions issued by the Architect. Color in the various ductwork, piping, equipment, apparatus and associated appurtenances exactly as they are erected.

D. The accurate location, depth, size and type of all concealed items shall be recorded before concealment to ensure accurate and direct future access doors and panels. Show inverts of all services at key points within the building, or buried items, and entering and leaving the building. Show dimensions from building grid lines.

E. The record drawings will be reviewed at regular intervals by the Architect and will be taken into consideration when reviewing the monthly applications for payment submitted by the HVAC Subcontractor.

F. When this procedure has been accomplished to the satisfaction of the Architect, the Record Drawing information shall be transferred to a set of CAD drawings by this Subcontractor and printed to PDF file format. The CAD file(s), in format .DWG 2004, and PDF file shall be submitted to the Architect, as directed in DIVISION 1, PROJECT CLOSEOUT. Electronic files shall be included with Mechanical System Operation and Maintenance Data as submitted to the Owner.

1.13 OPERATION AND MAINTENANCE DATA

A. Refer to DIVISION 1 - PROJECT CLOSEOUT

B. Assemble three copies of indexed hard cover manuals entitled “Operating and Maintenance Instructions for Mechanical System”.

C. Submit one copy for review at least two months before instructions to Owner are commenced. Instruct the Owner for one day (8 hours) as to the Operation-Maintenance of the System. This, and all instructional sessions, shall be videotaped and three (3) copies made and submitted to the Architect. Refer to DIVISION 1, PROJECT CLOSEOUT.

D. Ensure that the terminology used in various sections of the manual is consistent.

E. Refer to section 1.17 for Standard Reporting Requirements. Each manual shall contain the following information:
1. Description of each system, with description of each major component of the system.
2. Complete sets of approved page-size equipment shop drawings including temperature control drawings.
3. A lubrication schedule of all specified equipment.
4. Spare parts list.
5. Equipment identification list with serial numbers.
7. Final balancing reports.
8. Water treatment procedure and tests.
9. Names and telephone numbers of all equipment parts suppliers.
10. Control commissioning report
11. Equipment start-up reports
12. Two (2) “snap-shots” of the DDC points of the Automatic Temperature Control system. This data shall be compiled and recorded with the system in the “occupied” and “unoccupied” modes of each zone. Also include the schedule for these modes as established by the Owner.
13. CAD and PDF drawings in electronic format as described in DIVISION 23, RECORD RECORD DRAWINGS

1.14 SUBMITTALS

A. Refer to DIVISION 1 - SUBMITTAL PROCEDURES and specifications for submittal requirements. Without limiting the generality thereof, the HVAC Subcontractor shall also submit the additional information noted herein.

B. Present, not later than three (3) weeks after award of the Contract, a list of submittals to be submitted with the name of each manufacturer and supplier. Failure to submit this list will result in the necessity for the Contractor to use that equipment which is scheduled.

C. Submittals for equipment furnished under this Section shall include, but not be limited to all items listed in DIVISION 23 – HEATING VENTILATION AND AIR-CONDITIONING Article - WORK INCLUDED and listed within this specification. Refer to each article of this section for additional specific submittal requirements.

D. Do not manufacture, deliver or install equipment and materials until final review of Shop Drawings has been completed.

E. Submit one hard copy of certified submittals of all equipment, materials, equipment wiring, diagrams, motors, starters, controls and schedules. Ensure that submittals have adequate clear space for all stamps. When requested, resubmit promptly.
   1. When submitting electronically, provide email notification to ftconadmin@f-t.com with submittal file(s) attached in industry standard “.pdf” file format. If the submittal file(s) are too large for email transfer, provide hyperlink to files allowing both download and upload of files over internet connection without requiring use of usernames or passwords.

F. Identification: In addition to the information required by DIVISION 1 - SUBMITTAL PROCEDURES indicate:
   a. Name and address of supplier.
   b. Name of manufacturer.
   c. Reference specification section number, article number, article name and page number (e.g. 23 00 00 - 2.10 - VIBRATION ISOLATION AND SIESMIC RESTRAINT – Page 23 00 00 - 14)
   d. Identify if submittal is a resubmission of previous reviewed equipment.
e. Distribution list of all Trade subcontractors and manufacturers who will receive the Engineer’s reviewed comments.

G. Do not manufacture, deliver or install equipment and materials until final review of Submittals has been completed.

H. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
   a. Manufacturer's written recommendations.
   b. Manufacturer's product specifications.
   c. Manufacturer's installation instructions.
   d. Dimensions and Required clearances.
   e. Equipment Shipping and Operating weights and Structural Loads.
   f. Components required for field installation.
   g. Method of field assembly, components, and location and size of each field connection.
   h. Field electrical and mechanical connection requirements.
   i. Notation of coordination requirements.
   j. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
   k. Material gages and finishes.
   l. Standard color charts.
   m. Manufacturer's catalog cuts.
   n. Wiring diagrams showing factory-installed wiring.
   o. Certified performance curves for each fan, air handling unit and pump, showing duty and horsepower with design operating points over the components entire range indicated clearly.
   p. Certified performance ratings with system operating conditions indicated.
   q. Certified compliance with specified referenced standards. Testing by recognized testing agency.
   r. Motor ratings, electrical characteristics, and motor accessories.
   s. Filters with performance characteristics.
   t. Equipment Manufacturer supplied Dampers, housings, linkages, and operators.
   u. Equipment Manufacturer supplied valves and operators.
   v. All available specialties, options and accessories. Clearly indicated furnished specialties, options and accessories.
   w. Standard product operation and maintenance manuals.
   x. Notation of coordination requirements.
   y. Submit certified discharge and radiated sound power levels for:
      1) Equipment with compressors.

I. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data. Prepare shop drawings for all custom equipment such as air handlers, roof top units, custom roof curbs, cooling towers, pressure reducing stations, and any equipment that standard manufacturers printed data is not suitable for use.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Dimensions.
   b. Equipment Shipping and Operating weights.
c. Identification of products.
d. Fabrication and installation drawings.
e. Roughing-in and setting diagrams.
f. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
g. Design calculations.

J. Compliance with specified standards. Be responsible for presenting the processing of submittals to suit manufacturing schedule of equipment and construction schedule of building.

K. Be responsible for the accuracy of equipment dimensions relative to available space, the performance and the electrical characteristics. When required, submit a complete comparison between accepted alternative equipment and materials, and that which is specified.

L. Each submittal shall indicate clearly the correct name and address of the project, the intended use and location of the equipment, and the specified and/or scheduled designation tag/number.

M. Upon receipt of approved Submittals, distribute copies to all trades and manufacturers affected. Submit approved Submittals to authorities having jurisdiction when requested.

N. Keep one set of reviewed Submittals on the site at all times.

O. Bind one set of the corrected, reviewed and approved Submittals in each Operation and Maintenance Instructions Manual. Refer to DIVISION 1 - SUBMITTALS, DIVISION 1 - PROJECT CLOSEOUT and DIVISION 23 - HEATING VENTILATION AND AIR CONDITIONING article – OPERATION AND MAINTENANCE DATA.

P. Prior to submission of Submittals, the HVAC Subcontractor shall thoroughly check each shop drawing to ascertain that it complies with the Contract requirements; that the electrical characteristics are correct; and that the dimensions of work submitted fit the available space. Any deviations from the Contract requirements shall be clearly noted on the submittals. The HVAC Subcontractor shall stamp each submittal with his firm’s name, date and approval, thereby representing that the above has been complied with. Shop Drawings not so checked and stamped, shall be returned without being examined. Review of the Shop Drawings shall not relieve the HVAC Subcontractor from the responsibility for departures from the Contract Documents. Errors in shop drawings shall be the sole responsibility of the HVAC Subcontractor whether the drawings are reviewed or not.

Q. The HVAC Subcontractor shall submit to the General Contractor, for transmittal to the Owner, any samples requested by the Owner. Submittal, review, and approval of samples shall be in accordance with the Conditions of the Contract.

R. Drawings not stamped by the General Contractor shall be returned without being examined.

1.15 STANDARD REPORTING REQUIREMENTS

A. All reports shall be submitted in electronic and hardcopy format.
   1. Electronic reports shall be provided in PDF format.
   2. All reports must provide the following general information, at a minimum. Refer to individual specification paragraphs for additional reporting requirements.
      a. Project Location
      b. Date of report completion.
      c. Personnel involve in completing reports.
1.16 COORDINATION DRAWINGS

A. Prepare Coordination Drawings in accordance to the requirements of DIVISION 1 - SUBMITTAL PROCEDURES. Before work progresses, in addition to the shop drawings listed herein, coordination drawings shall be created and prepared by the HVAC and Sheetmetal Subcontractors in AutoCAD DWG electronic format. The Coordination Drawings once completed by the HVAC and Sheetmetal contractors shall be delivered to the Plumbing Contractor, Fire Protection Contractor and lastly the Electrical Contractor for inclusion of their respective equipment and systems. Provide drawings in electronic format, one 3/8 inch scale reproducible and one 3/8 inch scale blue print of coordination drawings.

B. Prepare Coordination Drawings in accordance to Division 1 and, in addition, adhere to the following:
1. Indicate temporary relocation, phasing, sequencing and moving of large equipment in the building during construction.
2. Floor plans and details, including the following:
   a. HVAC Coordination Drawings shall include, as a minimum, all supply, return and exhaust ductwork, VAV Boxes, air-handlers, fans, piping, pumps, isolation valves, thermostats and other similar controls and sensors, and all other equipment installed under this Section showing the adjoining work of the other trades at all floors, Mechanical Rooms and duct shafts. Refer to articles throughout this SECTION for additional coordination requirements.
   b. HVAC Sub-contractor shall note apparent conflicts and suggest alternate solutions.
   c. Composite systems coordination drawings showing how HVAC systems are to be installed where conflicts with the work of other trades may occur.
   d. Access Door and Panel Coordination: Show sizes and locations of all access panels and doors on coordination drawings.

C. The Contractor, before transmittal of the Coordination Drawings to the Owner for approval, may require the HVAC and Sheetmetal Subcontractors to revise the composite coordination drawings and shop drawings and to make reasonable modifications in the layout of the HVAC work, so that the HVAC work may be properly accommodated without the interference with work of other trades. The HVAC and Sheetmetal Subcontractors shall make such revisions to composite systems coordination drawings, when requested, without extra charge. For example, note that ductwork aspect ratio changes (up to a maximum of 5 to 1 width to height ratio) shall be considered reasonable changes and therefore made at no cost to the owner.

D. The HVAC Contractor shall be responsible for the cost for changes in the HVAC and adjoining work where an approved substitution of the HVAC equipment requires such changes in the HVAC work or in the adjoining work of any other trade. Provide coordination drawings showing all changes.

E. Sheetmetal ductwork installed in floor areas which may be in conflict with ceiling system. The Ceiling Contractor and the Sheetmetal Contractor shall coordinate the method of support and access for the ceiling. In no case shall the ductwork be used to support the ceiling construction nor shall it fall on the grid or its cross points unless the specific areas of conflict are allowed by the Architect/Engineer.

F. The Contractor, before transmittal of the Coordination Drawings to the Owner for approval, shall review with and obtain sign-off from the following contractors indicating that the work of their trade is fully coordinated:
1. General Contractor
2. HVAC contractor
3. Sheetmetal Contractor
4. ATC Contractor
5. Testing and Balancing Contractor
6. Electrical Contractor
7. Low voltage wiring contractor

1.17 REQUESTS FOR INTERPRETATION (RFIs)

A. Prepare Requests for Interpretation (RFIs) in accordance to Division 1 and, in addition, adhere to the following:
1. RFIs shall originate with the Contractor. RFIs submitted directly by sub-contractors will be returned with no response. RFIs sent directly to engineer will be returned with no response. Incomplete RFIs will not be reviewed and will be returned for additional information.
2. If email RFI submissions are allowed by Division 1 then the RFI and Attachment(s) shall be in Adobe Acrobat PDF format.
3. Submit RFIs in format specified and in addition include:
   a. Specification Section number and title and related paragraphs, as appropriate.
   b. Drawing number, room name, structural grid coordinates and detail references, as appropriate.
   c. Field dimensions and conditions, as appropriate.
   d. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
   e. Attachments: Include 8 ½” x 11” copies of construction documents highlighting areas requiring interpretation. Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation and suggested solution(s).
   f. Supplementary drawings prepared by Contractor shall be to scale and shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

1.18 IDENTIFICATION OF MECHANICAL SERVICES

A. After finish painting complete, identify all mechanical services. Use terminology consistent with the Drawings and Specifications. Refer to Division 1. A line item on the schedule of values for equipment identification shall be included.

B. Prepare flow diagrams (same size as record documents) of piping systems to identify equipment and valves. Include these diagrams in record drawings.
   1. Insert page-size copies of diagrams into each Operating and Maintenance Manual.
   2. Install schematic piping flow diagrams, framed under glass, on equipment room walls. Final location shall be as directed on site by Owner. All valves shall be identified in these diagrams.
   3. A line item in the schedule of values shall be dedicated to flow diagrams of mechanical services.

C. Provide typewritten master lists in Operating and Maintenance Instruction Manuals; and shop equipment numbers on Record Prints and sepias.

D. Identification shall be consistent with Owner's standard methods of identification.

1.19 PROTECTION

A. Protect all mechanical work from damage. Keep all equipment dry and clean at all times.
B. Cover openings in equipment, and pipes, with caps or heavy gauge plastic sheeting until final connections are made.

C. Correct at no cost to the Owner, any damage caused by improper storage, handling, or installation of equipment and materials.

D. Protect equipment, piping and temporary services installed within this SECTION from weather damage.

1.20 COORDINATION

A. Fully coordinate with other trades to ensure that work is carried out in the best interests of all concerned. Install work in proper sequence to conserve headroom and space.

B. Coordinate work with other trades to provide maximum accessibility for maintenance and operation of all equipment installed by all trades.

C. Give notices of requirements for holes, recessed openings, pits and chases before structure is to be erected.

D. Set all necessary sleeves and inserts before concrete is scheduled to be poured.

E. Furnish all items to be built-in, in ample time to allow schedules progress of work.

F. Refer to the Coordination Drawing Section of Specification for Coordination drawing process.

G. Provide the Electrical contractor and Plumbing Contractor with all requirements within Two (2) weeks from date of Contract to allow proper coordination of trades by the Contractor.

H. Verify with the Electrical contractor available electrical characteristics before ordering any equipment.

I. Furnish to the Electrical Contractor all starters, control devices, relays, pilot lights, accessories, contactors, wiring diagrams, and the like required for proper operation, connection and control of motorized equipment, as specified and/or shown on the drawings.

J. Electrical Contractor shall be responsible for the following:
   1. Mount and connect starters, controllers and disconnects, except where specified to be factory wired and mounted on the equipment.
   2. Provide all required power connections for all motor driven equipment.
   3. Provide power wiring to control transformers and control panels.

K. HVAC contractor provides low and line voltage control wiring to all equipment requiring control unless specifically called for on the Electrical Drawings or Specifications.

1.21 GUARANTEE

A. Conform to the requirements of DIVISION 1 - Project Close-out.
   1. All equipment, material and workmanship under Division 23 shall be unconditionally guaranteed for a period of one year starting at the end of commissioning, as set forth in the Contract, or for longer periods when stated in the Specifications. As an alternate scope of work, provide an additional one year labor and material warranty for a total of two years.
B. If any equipment or material does not match the manufacturer’s published data or specifically supplied rating schedules during performance tests, replace without delay the defective equipment or materials. Bear all associated costs and adjust all components at no charge to the Owner and adjust all components to achieve the proper rating.

C. Correct defects and deficiencies, and pay for resulting damage to Mechanical or other work, and to property and person, which appear or originate during the guaranteed period.

D. The Owner shall give notice of observed defects promptly in writing.

1.22 DRAIN PANS OVER ELECTRIC EQUIPMENT AND MOTORS

A. Wherever piping runs above motor control centers, panels or other electrical equipment due to field conditions or coordination process, a copper drip pan with drain outlet shall be provided.

B. Indicate on coordination drawings the locations where piping passes over motors and electric panels.

C. Drip pans shall have lips 2 inch high, stiffened and braced, supported to prevent sagging, and shall be pitched to a ¼” per foot toward the drain outlet. Drain outlet shall be piped, with approved piping, to nearest floor drain or other indirect waste connection. Width of pan shall extend 6 inches beyond piping, but shall not be less than 18 inches wide. All seams shall be soldered and watertight.

1.23 CONNECTIONS TO EQUIPMENT

A. The HVAC Subcontractor shall provide all duct and/or pipe connections to equipment provided under other sections of the specifications as shown on the contract documents and herein specified including final connections to equipment to result in a complete system, fully operational. Coordinate the locations of all equipment with Architect. Obtain installation diagrams and methods of installation of all equipment from manufacturers. Follow instructions strictly.

1.24 SEISMIC DESIGN

A. This project is located within a seismic zone requiring special provisions for the support and restraint of equipment and piping. Seismic-restraint devices shall have horizontal and vertical load testing and analysis performed according to the Office of Statewide Health Planning & Development for the State of California (OSHPD) and shall bear anchorage preapproval “R” number, from OSHPD or another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If pre-approved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer. Testing and calculations must include both shear and tensile loads and 1 test or analysis at 45 degrees to the weakest mode.

B. Submittals: Submit Shop Drawings and Product Data signed and sealed by a qualified professional engineer. Include the following:
   1. Design Calculations: Calculate requirements for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
2. Riser Supports: Include riser diagrams and calculations showing anticipated expansion and contraction at each support point, initial and final loads on building structure, spring deflection changes, and seismic loads. Include certification that riser system has been examined for excessive stress and that none will exist.

3. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, base weights, equipment static loads, power transmission, component misalignment, and cantilever loads.

4. Seismic-Restraint Details: Detail fabrication and attachment of seismic restraints and snubbers. Show anchorage details and indicate quantity, diameter, and depth of penetration of anchors.

5. Submittals for Interlocking Snubbers: Include load deflection curves up to 1/2-inch deflection in x, y, and z planes.

C. Where applicable and for high rise buildings, the seismic restraint design and construction requirements for equipment and piping incorporated as part of Life Safety Systems shall be such that these systems will remain in place and be functional following a major earthquake, and that the design shall consider lateral drifts between stories as specified by code.

1.25 HVAC BASIS OF DESIGN

A. For major pieces of HVAC equipment, including but not limited to chillers the engineers basis of design is the unit shown on the plans and listed in the schedules. The contractor may submit an alternate unit from the list of approved manufacturers in this specification IF he ensures that such unit has thermal and acoustical performance equal or better than the scheduled unit and IF he ensures that the unit fits within the allotted mechanical space.

B. For all outdoor mounted equipment, which differs from that shown on the schedules, the contractor must ensure that his submitted equipment does not violate any local noise ordinances.

C. Electrical characteristics of submitted equipment must match those of scheduled equipment. This means that voltages, phases and hertz of submitted equipment must be the same as scheduled equipment and that current draws (amperage) must be equal or less than scheduled equipment.

1.26 MANUFACTURERS REPRESENTATIVE

A. Provide, at the appropriate time and/or as directed by Architect, the services of a competent factory-trained Engineer of each piece of equipment. Manufacture representative shall inspect, adjust, troubleshoot and place in proper operating condition any and all items of the manufacturer.

B. No additional compensation will be allowed Contractor for such services.

C. Refer to the individual specification paragraphs for additional Manufacturer representative requirements.

D. Site visits and Field/Startup Reports
1. Refer to section 1.17 for Standard Reporting Requirements.
2. Prepare field/startup reports in accordance to Division 1 and, in addition, adhere to the following:
   a. Provide field report as for each site visit.
b. Manufacturer shall check-in with owner or project representative at each field visit.

c. Report shall include at a minimum:
   1) Date, Time and weather conditions
   2) Present during visit
   3) Reason for visit
   4) Standard manufacturer’s startup forms/checklists
   5) Results of visit
   6) Any deficiencies requiring repair/replacement
   7) Follow-up actions required

3. Submit reports for approval.

4. Include approved reports in close out documents.

1.27 HVAC SYSTEM DEMONSTRATION

A. At completion of the HVAC system installation, testing and balancing and start up, the mechanical contractor shall demonstrate to the owner and to the engineer the proper operation of all major HVAC systems. This shall include but not be limited to temperature controls, chillers and cooling towers, air handlers, boilers, rooftop units, kitchen make up and exhaust systems, fan systems, pumps, terminal units and computer room units. Allow minimum of one full day (8 hours) for this demonstration.

B. Provide owner and engineer at least one week notice before demonstration is to begin. Mechanical contractor shall ensure the presence of personnel from local manufacturer’s representative for the specific pieces of equipment involved as well as for the automatic temperature controls contractor who shall be present throughout the entire procedure.

C. If a piece of equipment has an occupied/unoccupied cycle or otherwise has two speed operations all control cycles and speeds are to be demonstrated.

D. If any piece of equipment or control cycle does not operate as specified then this contractor shall remedy the deficiency and repeat the demonstration in the owner's and engineers presence.

1.28 RELATED DOCUMENTS

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

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. ACCEPTABLE MANUFACTURERS
   1. Anvil
   2. Charlotte
   3. Atlas

B. PIPE AND TUBE
   1. Black Steel Pipe: ASTM A 53, A 106 or A 120; except comply with ASTM A 53 or A 106 where close coiling or bending is required
C. FITTINGS
3. Malleable Iron Threaded Fittings: ANSI B 16.3; plain or galvanized as indicated.
4. Malleable Iron Threaded Unions: ANSI B 16.39; selected by installer for proper piping fabrication and service requirements, including style, end connections, and metal to metal seats (iron, bronze or brass); plain or galvanized as indicated.
5. Wrought-Steel Butt welding Fittings: ANSI B 16.9; except B 16.28 for short radius elbows and returns; rated to match connected pipe.

D. UNIONS AND COUPLINGS
1. Pipe Size over 2 inch: 150 psi steel butt weld flanges for ferrous piping

E. MISCELLANEOUS PIPING MATERIALS/PRODUCTS
2. Gaskets for Flanged Joints: ANSI B 16.21; full faced for cast iron flanges; raised faced for steel flanges, unless otherwise indicated.

2.2 VIBRATION ISOLATION, SUPPORTS AND SEISMIC RESTRAINT

A. ACCEPTABLE MANUFACTURERS
2. Mason Industries Inc.
3. Vibration Mountings and Controls, Inc.

B. GENERAL
1. All vibration isolation, supports and seismic devices described in this section shall be the product of a single supplier. NAI (Novia Associates, Inc.) is the Basis of Design of these specifications; products of other suppliers may be acceptable provided their systems strictly comply with intent, structural design, performance and deflections of the Basis of Design.
2. It is the intent of the seismic restraint portion of this specification to provide restraint of non-structural building components. Restraint systems are intended to withstand the stipulated seismic accelerations applied through the component's center of gravity.
3. Each and every support attachment to the structure of equipment that meets the requirements of this specification must be positive, including equipment that may be excluded from auxiliary seismic bracing as noted in Part 3.

C. The work in this section includes the following:
1. Vibration isolation elements for equipment.
2. Equipment isolation bases.
3. Pipe and Duct Supports.
4. Piping flexible connectors.
5. Seismic restraints for isolated equipment.
7. Certification of seismic restraint designs and installation supervision.
8. Equipment support stands, bases or rails.
9. Structural design of all vibration isolation, supports and seismic restraints.

D. SUBMITTALS
1. Product Data sheets on
a. For each specific vibration isolators and restraints to be utilized detailing compliance with the specification. Reference "TYPE" as per "PRODUCTS" section of this specification.

b. An itemized list of all isolated and non-isolated equipment including detailed schedules showing isolator, support and seismic restraints proposed for each piece of equipment, referencing material and calculation drawing numbers.

2. Shop Drawings
   a. Show base construction for equipment; include dimensions, structural member sizes and support point locations.
   b. When walls and slabs are used as support and/or seismic restraint locations, details of acceptable methods for ducts and pipe must be included.
   c. Indicate isolation devices selected with complete dimensional and deflection data before condition is accepted for installation.
   d. Provide specific details of isolators, supports and seismic restraints and anchors; include number, size and locations for each piece of equipment.
   e. Coordinated or contract drawings shall be marked-up with the specific locations and types of isolators, supports and restraints shown for all pipe and duct. Rod bracing requirements and assigned load at each location shall be clearly delineated. Any and all tributary loads shall be considered for proper sizing.
   f. For ceiling suspended equipment design restraints for a minimum installation angle of 30° from vertical. Indicate maximum installation angle allowed for restraint system as well as braced and unbraced rod lengths at each allowable installation condition.
   g. Calculate thrust for fan heads, axial and centrifugal fans to determine whether thrust restraints are required. (See EQUIPMENT INSTALLATION)

3. Structural Certification and Analysis
   a. Seismic restraint calculations must be provided for all connections of equipment to the structure. All performance of products (such as; strut, cable, anchors, clips, etc.) associated with restraints must be supported with manufacturer's data sheets or certified calculations.
   b. Isolator calculations must be provided for all connections of equipment to the structure. All performance of products associated with isolators must be supported with manufacturer's data sheets or certified structural calculations.
   c. Support calculations must be provided for all connections of equipment to the structure. All performance of products associated with supports must be supported with manufacturer's data sheets or certified structural calculations.
   d. For roof mounted equipment both the seismic acceleration, wind loads (30 psf), and snow loads shall be calculated, the highest load shall be utilized for the design of the isolator, support and/or restraints.
   e. Certifications of calculations to document isolators, supports and seismic restraint designs must be stamped by a professional engineer registered in the State were the project is located.
      1) Analysis must indicate calculated dead loads, derived loads and materials utilized for connections to equipment and structure. Analysis must detail anchoring methods, bolt diameter, embedment and weld length.

4. An in force, Errors and Omissions insurance certificate must accompany submittals. Manufacturer’s product liability insurance certificates are not acceptable.

E. MANUFACTURER’S RESPONSIBILITY
   1. Manufacturer of isolators, supports and vibration and seismic control equipment shall have the following responsibilities:
      a. Determine vibration isolation, support and seismic restraint sizes and locations.
      b. Provide equipment vibration isolation, support and seismic restraints as specified.
      c. Guarantee specified isolation system deflections.
      d. Provide installation instructions, drawings and field supervision to insure proper installation and performance of systems.
F. RELATED WORK
   1. Housekeeping Pads
      a. Housekeeping pad attachment to structure design shall be by the project structural
         engineer. Material and labor required for attachment and construction shall be by
         the concrete section contractor.
      b. Housekeeping pads shall be coordinated with the Seismic Restraint Supplier and
         sized to provide a minimum edge distance of 13 bolt diameters of clearance all
         around the outermost anchor bolt to allow for the use of full anchor ratings.
   2. Supplementary Support Steel
      a. Contractor shall supply supplementary support steel and connections for all
         equipment, piping, ductwork, etc. Including roof mounted equipment, as required
         or specified.
      b. Where support for equipment requires stands, bases, rails, etc. these devices shall
         be designed and fabricated by Seismic Restraint Supplier to ensure the seismic
         capability of the entire installation.
   3. Attachments
      a. Contractor shall provide restraint attachment plates cast into housekeeping pads,
         concrete inserts, double sided beam clamps, etc. as directed by the Seismic
         Restraint Supplier.

G. SEISMIC RESTRAINTS AND VIBRATION ISOLATION TYPES
   1. General
      a. All isolation and seismic restraint devices shall be capable of accepting, without
         failure, the "G" forces as determined by the seismic certification and calculations
         as described in the "SUBMITTAL DATA REQUIREMENTS" section of these
         specifications.
      b. Corrosion protection for outdoor applications shall be as follows:
         1) Springs shall be cadmium plated, zinc electroplated or powder coated.
         2) Hardware shall be cadmium or zinc plated.
         3) All other metal parts shall be hot spray or hot dipped galvanized or zinc
            electroplated.
      c. All seismic restraint devices
         1) Shall maintain the equipment in a captive position and not short circuit
            isolation device during normal operating conditions.
         2) Shall have provisions for bolting and/or welding to the structure.
      d. Welding of springs to isolator housing, base plates, etc. is strictly prohibited.
   2. Seismic Restraint Types
      a. TYPE I: Same as Type B isolator.
      b. TYPE II: Where required, each corner or side of equipment base shall incorporate
         a seismic restraint snubber having an all directional resilient neoprene pad limit
         stops. Restraints shall be fabricated of plate, structural members or square metal
         tubing. Model "SS" as manufactured by NAI.
      c. TYPE III: Restraints for suspended systems.
         1) Vibration isolated systems shall be braced with multiple 7 x 19 galvanized
            steel cables with approved attachment devices (such as thimbles and wire
            rope clips) to equipment and structure.
         2) Non-isolated systems shall be braced with structural steel strut or cable with
            approved attachment devices to equipment and structure.
         3) Steel angles (by contractor) shall be provided to prevent rod bending of
            hung equipment where indicated by the Seismic Restraint Supplier’s
            submittals. Steel angles shall be attached to the rods with a minimum of
            three clamps model “SRC” at each restraint location. Welding of support
            rods to angles is not acceptable.
      d. TYPE IV: Double deflection neoprene.
         1) Mountings shall be fabricated to resist the wind or seismic forces. Model
            "RNM" as manufactured by NAI.
e. TYPE V: Rigid attachment to structure utilizing wedge type expansion anchors for bolting and steel plates, either cast-in or anchored with wedge type expansion bolts, for welding. Powder shots are not acceptable. Concrete anchor bolt spacing shall be in accordance with anchor manufacturer’s published standards.

3. Vibration Isolator Types
a. TYPE A: Spring Isolator - Free Standing
1) Spring shall have a minimum outer diameter to overall height ratio of 0.8: 1 at rated deflection.
2) Reserve deflection (from published load ratings to solid height) of 50% of the rated deflection.
3) Minimum 1/4” thick neoprene acoustical base pad or cup on underside, unless designated otherwise.
4) Model “SM” as manufactured by NAI.

b. TYPE B: Spring Isolator - Restrained
1) Shall be the same as TYPE A with the following additional features.
   a) Integral restraining bolts with elastomeric cushions preventing metal-to-metal contact.
   b) Internal spring adjusting nut or bolt.
   c) Built-in all-directional limit stops with minimum 1/8” clearance under normal operation.
   d) Model “RSM” as manufactured by NAI.

c. TYPE C: Spring Hanger Isolator
1) a. Spring element (same as TYPE A) within a steel box with an Elastomer bushing to insulate lower support rod from the hanger box.
   b. Steel hanger box shall be capable of 30-degree misalignment between the rod attachment to structure and the connection to the supported equipment. Hanger boxes shall withstand three times the rated load without failure.
3) Model “SH” as manufactured by NAI.

d. TYPE D: Double deflection neoprene
1) Mountings shall be fabricated to resist the wind or seismic forces.
2) Model “RNM” as manufactured by NAI.

e. TYPE E: Elastomer Hanger Isolator
1) Molded neoprene element with a bushing to insulate lower support rod from the hanger box.
2) Steel hanger box shall withstand three times the rated load without failure.
3) Model “NH” as manufactured by NAI.

f. TYPE F: Combination Spring/Elastomer Hanger Isolator
1) Spring and neoprene elements in a steel hanger box with the features as described for TYPE C and E isolators.
2) Model “SNH” as manufactured by NAI.

g. TYPE G: Pad type elastomer isolator
1) Neoprene pad shall have 0.50” minimum thickness, deflection rating of 0.1 inch under rated load.
2) 1/16” galvanized steel plate between multiple pad layers.
3) Load distribution plate where attachment to equipment bearing surface is less than 75% of the pad area.
4) When bolting is required for seismic compliance, neoprene and duck washers and bushings shall be provided to prevent short-circuiting of bolt.
5) Model “NP” as manufactured by NAI.

h. TYPE H: Pad type elastomer isolator
1) Laminated canvas duck & neoprene, maximum loading 1000 psi, minimum ½” thick.
2) Load distribution plate where attachment to equipment bearing surface is less than 75% of the pad area.
3) When bolting is required for seismic compliance, neoprene and duck washers and bushings shall be provided to prevent short-circuiting.

4) Model “LNP” as manufactured by NAI.

i. TYPE K: Resilient Pipe Anchors and Guides
   1) All directional acoustical pipe anchor, consisting of a telescopic arrangement of two sizes of steel tubing separated by a minimum ½” thickness of TYPE H pad.
   2) Vertical restraint shall be provided by a similar material arranged to prevent vertical travel in either direction.
   3) Allowable loads on neoprene pad shall not exceed 500 PSI and the design shall be balanced for equal resistance in any direction.
   4) Model “RAG” as manufactured by NAI.

H. EQUIPMENT BASES, CURBS & SUPPORTS
1. GENERAL
   a. All curbs, roof rails, isolators and supports are to be bolted or welded to the structure to attain the higher of the specified acceleration criteria or a minimum 30 PSF wind load or snow load applied to the largest face area.
   b. All non-galvanized materials shall be prime paint finished.
   c. Review roof top mounted equipment sections of these specifications and contract drawings for supplementary conditions and/or requirements.
   d. Operating height for roof mounted supports & curbs shall be as shown on the drawings.
   e. Provide pre-drilled holes for all roof mounted curbs and rails for attachment to the building structure.

2. BASE TYPES
   a. TYPE B-1: Integral Structural Steel Base
      1) Constructed of structural members as required to prevent base flexure at equipment startup and misalignment of driver and driven units. Perimeter members shall be a minimum of 1/10th the longest unsupported span. Centrifugals shall be complete with motor slide rails and drilled for driver and driven units.
      2) Height saving brackets shall be used to maintain 1” operating clearance under base.
      3) Model “SB” as manufactured by NAI.
   b. TYPE B-7: Steel Rails
      1) Steel members of sufficient strength to prevent equipment flexure during operation.
      2) Height saving brackets as required to reduce operating height.
      3) Model “SR” as manufactured by NAI.

I. FLEXIBLE CONNECTORS
1. All connectors shall be installed on the equipment side of shutoff valves; horizontal and parallel to equipment shafts whenever possible. Piping shall be supported and/or anchored to resist pipe movement beyond the allowable movement of the flexible connector. Installations must include check valves and/or other design and installation precautions to reduce the threat to life safety when subjected to the specified seismic accelerations.

2. TYPE FC-1: Spherical Elastomer connector
   a. Manufactured of EPDM.
   b. Sizes 2” and larger shall have two spheres reinforced with an external ring between spheres. Bolted-on strap type reinforcing is not acceptable. Sizes 16” to 24” may be single sphere.
   c. Threaded one piece bolted flange assemblies with female threaded ends for sizes 3/4” to 1-1/2”.

HEATING VENTILATION AND AIR-CONDITIONING
d. Rated at 250 psi up to 1700 F, with a uniform drop in allowable pressure to 170 psi at 2500 F for sizes through 14”. 16” through 24” single sphere minimum ratings are 180 psi at 1700 F and 130 psi at 2500 F.

e. Connectors shall be installed in piping gaps equal to the length of the connector under pressure.

f. Control rods are required in unanchored installations where the installation exceeds the pressure limitation without control rods.

1) Control rods shall have ½” thick Neoprene washer bushings large enough in diameter to take the thrust at 1,000 psi maximum on the washer area.

g. Connectors bolted to Victaulic type coupling or gate, butterfly or check valves to have a minimum 5/8” flange spacer (by others) installed between the connector and the coupling flange. Connectors must mate to a flat-faced flange in all instances.

3. TYPE FC-2: Flexible Stainless Steel Hose

a. Stainless steel hose and braid rated with 3:1 safety factor.

b. 2” diameter and smaller with male nipples, 2-1/2” and larger with fixed flat faced steel flanges.

1) Lengths shall be: 9” for 2-1/2” to 4”, 11” for 5” and 6”, 12” for 8”, 13” for 10”, 14” for 12” to 16”.

4. TYPE FC-4: Wire Braid Reinforced Flexible Metal Hose

a. Metal hose and braid rated with a minimum 3:1 safety factor. (Minimum 150 PSI)

b. Copper tube ends.

2.3 MOTORS AND MOTOR STARTERS

A. MOTOR ACCEPTABLE MANUFACTURERS

1. General Electric
2. Baldor
3. Lincoln

B. GENERAL CONSTRUCTION AND REQUIREMENTS

1. Motors Less Than 250 Watts, for Intermittent Service: Equipment manufacturer's standard and need not conform to these specifications.

2. Single Phase Motors: PSC where available.

3. Electrical Service:

4. Refer to DIVISION 26 – ELECTRICAL for required electrical characteristics.

5. Open drip-proof type except where specifically noted otherwise.

6. Design for continuous operation in 40 degrees C environment.

7. Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.

8. Motors connected to variable frequency drives shall meet requirements of NEMA MG-11, Part 31 and stated as frequency drive compatible. Motors shall be suitable for use with repeated voltage peaks of 1600 volts with rise time of 0.1 microseconds or greater.


10. Visible Nameplate: Indicating manufacturer's name and model number, motor horsepower, RPM, frame size, voltage, phase, cycles, full load amps, insulation system class, service factor, maximum ambient temperature, temperature rise at rated horsepower, minimum efficiency.

11. Wiring Terminations:

a. Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.

b. For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.
C. SINGLE PHASE POWER - SPLIT PHASE MOTORS
   1. Starting Torque: Less than 150 percent of full load torque.
   2. Starting Current: Up to seven times full load current.
   4. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve or ball bearings.
   5. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

D. SINGLE PHASE POWER - PERMANENT-SPLIT CAPACITOR MOTORS
   1. Starting Torque: Exceeding one fourth of full load torque.
   2. Starting Current: Up to six times full load current.
   3. Multiple Speed: Through tapped windings.
   4. Open Drip-proof or Enclosed Air Over Enclosure: Class A (50 degrees C temperature rise) insulation, minimum 1.0 Service Factor, prelubricated sleeve or ball bearings, automatic reset overload protector.

E. SINGLE PHASE POWER - CAPACITOR START MOTORS
   1. Starting Torque: Three times full load torque.
   2. Starting Current: Less than five times full load current.
   3. Pull-up Torque: Up to 350 percent of full load torque.
   5. Motors: Capacitor in series with starting winding; provide capacitor-start/capacitor-run motors with two capacitors in parallel with run capacitor remaining in circuit at operating speeds.
   6. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, prelubricated sleeve ball bearings.
   7. Enclosed Motors: Class A (50 degrees C temperature rise) insulation, 1.0 Service Factor, prelubricated ball bearings.

F. THREE PHASE POWER - SQUIRREL-CAGE MOTORS
   1. Starting Torque: Between 1 and 1-1/2 times full load torque.
   2. Starting Current: Six times full load current.
   3. Power Output, Locked Rotor Torque, Breakdown or Pull Out Torque: NEMA Design B characteristics.
   5. Insulation System: NEMA Class B or better.
   6. Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.
   7. Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy encapsulated solid state control relay with wiring to terminal box.
   8. Bearings: Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum AFBMA 9, L-10 life of 200,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt centre line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
   10. Part Winding Start Where Indicated: Use part of winding to reduce locked rotor starting current to approximately 60 percent of full winding locked rotor current while providing approximately 50 percent of full winding locked rotor torque.
   11. Weatherproof Epoxy Sealed or Treated Motors: Epoxy seal windings using vacuum and pressure to coat windings with rotor and starter surfaces protected with epoxy enamel; bearings double shielded with waterproof non-washing grease.
   12. Nominal Efficiency: To NEMA MG 1, energy efficient for frame sizes 215T and larger.
G. Starters shall be in NEMA type 1 general purpose wall-mounted enclosures, except NEMA type 3R enclosures shall be used where the starter is exposed to the weather and NEMA type 7 enclosures shall be used in all hazardous locations. Starters shall be sized per NEMA standards to match motor voltage and horsepower. Overload relays shall be provided in each conductor to the motor. These relays shall be of the bi-metallic “inverse-time” type. Heaters shall be provided of the correct size for the motor controlled. Two (2) sets of auxiliary contacts shall be provided with each starter in addition to those needed for normal operation, or in addition to those required by the wiring diagrams. These auxiliary contacts shall be form C, “normally open/closed”.

H. Start-stop momentary pushbuttons shall be located in the covers of the starter enclosure unless other type of starting switches are required. Red and green pilot lights shall be located in the cover of the starter enclosure to indicate position of main contacts. H-O-A switches shall be included in the starter for all mechanical equipment with automatic control signals.

I. Magnetic or manual starters shall be manufactured by one of the following:
   1. General Electric Company
   2. Square D Company
   3. Allen-Bradley Company

2.4 METERS AND GAUGES

A. PRESSURE GAGES
   1. Gage: ASME B40.1, with bourdon tube, rotary brass movement, brass socket, front recalibration adjustment, black scale on white background.
      a. Case: Steel
      b. Bourdon Tube: Brass.
      c. Dial Size: 2 inch.
      d. Mid-Scale Accuracy: One percent.
      e. Scale: Psi.
      f. Provide pulsation damper for all pressure gauges
      g. All pump and other vibration areas shall utilize liquid filled gauges
      h. All steam piping pressure gauges shall be provided with coil siphons

B. STEM TYPE THERMOMETERS
   1. Thermometer: ASTM E1, red appearing mercury, lens front tube, cast aluminum case with enamel finish.
      a. Size: 7 inch scale.
      b. Window: Clear glass.
      c. Stem: Brass, 3/4 inch NPT, 3-1/2 inch long.
      d. Accuracy: ASTM E77 2 percent.
      e. Calibration: Degrees F.
      f. Scale shall be 30 – 240 deg. with 2 deg. F. divisions for hot water and 30-180 deg. with 2 deg F divisions for chilled water.

C. TEST PLUGS
   1. Test Plug:
      a. 1/4 inch NPT or 1/2 inch NPT brass stainless steel fitting and cap for receiving 1/8 inch outside diameter pressure or temperature probe with:
      b. Neoprene core for temperatures up to 200 degrees F.
      c. Test Kit:
         1) Carrying case, internally padded and fitted containing:
         2) One 2 inch diameter pressure gages.
         3) Two gage adapters with 1/8 inch probes.
4) Two one inch 1-1/2 inch dial thermometers.

2.5 PIPING SPECIALTIES

A. PIPE ESCUTCHEONS
1. General: Provide pipe escutcheons as specified herein with inside diameter closely fitting pipe or pipe insulation outside diameter. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extension, if any. Furnish pipe escutcheons with nickel or chrome finish for occupied areas, prime paint finish for unoccupied areas.
2. Pipe Escutcheons for Moist Areas: For waterproof floors, and areas where water and condensation can be expected to accumulate, provide cast brass or sheet brass escutcheons, solid or split hinged.
3. Pipe Escutcheons for Dry Areas: Provide sheet steel escutcheons, solid or split hinged.

B. Y-TYPE PIPELINE STRAINERS
1. General: Provide strainers full line size of connecting piping, with ends matching piping systems materials. Select strainers for 125 psi working pressure, with Type 304 stainless steel screens, with 3/64" perforations @ 233 per sq. in.
2. Flanged Ends - 2-1/2" and Larger: Cast-iron body, bolted screen retainer with off center blowdown fitted with pipe plug.
3. Grooved Ends: Ductile iron body, ASTM A-536, type 304 stainless steel, removable basket with 1/16" diameter perforation.
4. ACCEPTABLE MANUFACTURERS
   b. Hoffman Specialty ITT; Fluid Handling Div.
   c. Spirax Sarco.

C. DIELECTRIC FITTINGS
1. General: Provide standard products for use in service indicated, which effectively isolate ferrous from non-ferrous piping (electrical conductance), prevent galvanic action, and stop corrosion.
2. Dielectric couplings or brass ball valves shall be the preferred method of ferrous / non-ferrous isolation.
3. Dielectric unions shall be used only with prior permission.

D. MECHANICAL SLEEVE SEALS
1. General: Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.
2. ACCEPTABLE MANUFACTURERS
   a. Thunderline Corp.

E. FIRE BARRIER PENETRATION SEALS
1. Provide seals for any opening through fire rated walls, floors, or ceilings used as passage for mechanical components and piping.
2. Cracks, Voids, or Holes UP to 4" Diameter: Use putty or caulking, one piece intumescent elastomer, non-corrosive to metal, compatible with synthetic cable jackets, and capable of expanding 10 times when exposed to flame or heat, UL listed.
3. Openings 4" or Greater: Use sealing system capable of passing 3-hour fire test in accordance with ASTM E-814, consisting of wall wrap or liner, partitions, and end caps capable of expanding when exposed to temperatures of 250 to 350 deg. F., UL listed.
4. ACCEPTABLE MANUFACTURERS
a. Electro Products Div./3M.

b. Nelson; Unit of General Signal.

F. FABRICATED PIPING SPECIALTIES
1. Pipe Sleeves: Provide pipe sleeves of one of the following:
2. Sheet-Metal: Galvanized sheet steel. Fabricate of following gages: 3" and smaller, 20 gage, 4" to 6", 16 gage, over 6", 14 gauge.
3. Steel-Pipe: Fabricate from schedule 40 galvanized steel pipe; remove burrs.
4. Plastic-Pipe: Fabricate from Schedule 80 PVC plastic pipe; remove burrs.
5. Sleeve Seals: Provide sleeve seals for sleeves located in foundation walls below grade, or in exterior walls.

2.6 VALVES

A. ACCEPTABLE MANUFACTURERS
   a. Stockham
   b. Crane
   c. Milwaukee
   d. High-Performance Butterfly Valves
      1) Bray
      2) Approved equal

B. SUBMITTALS
1. Product Data: For each type of valve indicated. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.
2. Shop Drawing: Show valves on Coordination drawings. Refer to 'COORDINATION DRAWINGS' this SECTION.

C. GENERAL
1. Provide valves of same manufacturer throughout where possible.
2. Where a single acceptable manufacturer does not produce all valve types required, multiple manufacturers may be used, but in no case shall the same type valve be provided by different manufacturers.
3. Valve manufacturers and their valve numbers indicated herein are meant to describe type and quality only.
4. ASME Compliance: ASME B31.9 for building services piping valves.
5. ASME Compliance for Ferrous Valves: ASME B16.10 and ASME B16.34 for dimension and design criteria.

D. GATE VALVES
1. Type GV2: Bronze, non-rising stem, inside screw, solid wedge, screwed ends, Class 150, (Stockham Fig.B-128).
2. Type GV3: Bronze, Rising stem, inside screw, solid wedge, screwed ends, Class 150, (Stockham Fig. B-122).
3. Type GV4: Iron body, bronze trim, OS&Y, solid wedge, rising stem, flanged ends, Class 125, (Stockham Fig. G-623).
4. Type GV5: Iron body, bronze trim, OS&Y, solid wedge, rising stem, flanged ends, Class 250, (Stockham Fig. F667).
5. Type GV6: Bronze, non-rising stem, inside screw, solid wedge, screwed ends, screw-in bonnet, Class 300, (Stockham Fig. B-147).
E. GLOBE VALVES
1. Type GLV2: Bronze, rising stem, stainless disc and seat ring, screw-over bonnet, screwed ends, Class 150, (Stockham Fig. B-29).
2. Type GLV3: Iron body, bronze trim, OS&Y, renewable composition disc, rising stem, flanged ends, Class 125, (Stockham Fig. G512).
3. Type GLV4: Iron body, bronze trim, OS&Y, renewable bronze disc and seat ring, rising stem, flanged ends, Class 250, (Stockham Fig. F-532).
4. Type GLV5: Bronze, rising stem, renewable stainless seats, screw-over bonnet, screwed ends, 250 psi, (Stockham Fig. B-74).

F. BALL VALVES
1. Type BLV1: Bronze body and retainer, reinforced Teflon seats and packing, chromium plated ball, soldered ends, full port (Apollo 77-200).
2. Type BLV2: Bronze body and retainer, reinforced Teflon seats and packing, chromium plated ball, screwed ends, full port (Apollo 77-100).
3. Provide extended stems for all valves in insulated piping systems. Stems shall extend to length necessary for full handle exposure outside of insulation system.

G. BUTTERFLY VALVES
1. Type BFV1: High performance, carbon steel lug body, stainless steel disc, all-metal seat, combination metal and PTFE seal, stainless steel stem, class 150, -20 to 500 deg. F. (Bray Series 40).
2. Grooved End: Ductile iron body and disc. Seat tested to MSS-SP-67, Bubble tight, bi-directional dead end service to 300 psi. The disc coating shall be suitable for intended service. Valves shall be Victaulic Series 300 or equivalents by Stockham and Grinnell.
3. Unless otherwise indicated provide lever operators for valves 6” and less and gear operators for valves 8” and larger.

H. CHECK VALVES
1. Type SCV1: Swing check valve, bronze body, regrinding bronze disc, soldered ends, 300 psi, (Stockham Fig. B-321).
2. Type SCV2: Swing check valve, bronze body, regrinding bronze disc, screwed ends, Class 300, (Stockham Fig. B375).
3. Type SCV3: Swing check valve, iron body, regrind-renew bronze disc and seat ring, flanged ends, Class 125, (Stockham Fig. G931).
4. Type SCV4: Swing check valve, iron body, regrind-renew bronze disc and seat ring, flanged ends, 250 psi, (Stockham Fig. F947).
5. Type LCV1: Lift check valve, bronze body, bronze disc, spring loaded, screw over cap, screwed ends, Class 150 (Stockham Fig. B-322T).
6. Type WCV1: Wafer check valve, iron body, bronze trim, bronze disc, stainless steel spring, (Stockham Fig. WG-961).

I. DRAIN VALVES
1. Type DV1: Ball or gate valve with hose end, bronze cap and chain.

J. PLUG VALVES
1. Type PV1: Semi-steel, bolt gland type, (Rockwell Fig. 142 or 143).

K. VALVES FOR HYDRONIC SYSTEMS
1. Valves for hydronic systems shall be as follows:
   a. BALL VALVES:
      1) 2” and Less (Soldered Ends); Type BLV1.
      2) 2” and Less (Screwed Ends); Type BLV2.
   b. BUTTERFLY VALVES
      1) 2-1/2” and Larger; BFV1.
   c. SWING CHECK VALVES
1)  2-1/2" and Larger (Flanged Ends Pressure under 125 PSI); SCV3.
2)  2-1/2" and Larger (Flanged Ends Pressure over 125 PSI); SCV4.

d. LIFT CHECK VALVES:
   1)  2" and Less; Type LCV1.

e. WAFFER CHECK VALVES (For Use on Pump Discharge Services):
   1)  All Sizes; WCV1.

f. DRAIN VALVES:
   1)  Type DV1.

g. PLUG VALVES:
   1)  Type PV1

2.7 HANGERS AND SUPPORTS

A. ACCEPTABLE MANUFACTURERS
   a. Carpenter and Patterson, Inc.
   b. Elcen Metal Products Co.
   c. ITT Grinnell Corp.

B. GENERAL:
   1. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.
   2. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."
   3. Coordinate provision of all Hangers and Supports with the seismic restraints portion of
      this specification. Hangers and Supports provided shall not compromise the ability of the
      piping system to resist seismic loads.

C. PIPE HANGERS AND SUPPORTS
   1. Hangers for Pipe Sizes 6 Inch and Over: Single cast iron pipe roll, double hangers; MSS
      Type 41.
   2. Shield for all hot piping 4 inch and larger: Steel pipe covering protection saddle; MSS
      Type 39. Fill void with insulating cement.
   3. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast
      iron roll and stand for hot pipe sizes 6" and over.
   4. Wall Support for Pipe Sizes 4 Inch and Over: Welded steel bracket and wrought steel
      clamp; adjustable steel yoke and cast iron roll for hot pipe sizes 6 inch and over.
   5. Vertical Support: Steel riser clamp.
   6. Floor Support for Pipe Sizes to 4 Inch and All Cold Pipe Sizes: Cast iron adjustable pipe
      saddle, locknut nipple, floor flange, and concrete pier or steel support.
   7. Floor Support for Pipe Sizes to 6 Inch and Over: Adjustable cast iron roll and stand, steel
      screws, and concrete pier or steel support.
   8. Provide copper plated hangers and supports for copper piping systems.

D. HANGER RODS
   1. Steel Hanger rods: Continuous threaded.

E. INSERTS AND BUILDING ATTACHMENTS
   1. Inserts: Malleable iron case of steel shell and expander plug for threaded connection with
      lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to
      suit threaded hanger rods.
   2. Provide: Provide steel beam clamps, C-clamps, and steel brackets as required to accept
      threaded rods.
2.8 MECHANICAL IDENTIFICATION

A. ACCEPTABLE MANUFACTURERS
   1. Allen Systems, Inc.
   3. Seton Name Plate Corp.

B. SUBMITTALS
   1. Product Data: For each type of product indicated.
   2. Valve numbering scheme.
   3. Valve Schedules: For each piping system. Furnish extra copies (in addition to mounted
copies) to include in maintenance manuals.

C. MATERIALS
   1. Unless specified otherwise, comply with ASME A13.1, "Scheme for the Identification of
   Piping Systems," for letter size, length of color field, colors, and viewing angles of
   identification devices for piping.
   2. Plastic Nameplates: Laminated three-layer plastic with engraved black letters on light
   contrasting background.
   3. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with
   smooth edges.
   4. Plastic Pipe Markers: Factory fabricated, flexible, semi rigid plastic, preformed to fit
   around pipe or pipe covering; minimum information indicating flow direction arrow and
   fluid being conveyed. On piping three (3) inches diameter (including insulation) and
   larger, lettering shall be two (2) inches high capitals. On smaller diameter piping, use ¾
   inch high capital letters.
   5. Equipment Nameplates: Metal, with data engraved or stamped, for permanent
   attachment on equipment.
      a. Data:
         1) Manufacturer, product name, model number, and serial number.
         2) Capacity, operating and power characteristics, and essential data.
         3) Labels of tested compliances.
      b. Location: Accessible and visible.
      c. Size: 2-1/2 by 4 inches for control devices, dampers, and valves; 4-1/2 by 6
         inches for equipment.
      d. Fasteners: As required to mount on equipment.
   6. Equipment Markers: Engraved, color-coded laminated plastic. Include contact-type,
   permanent adhesive.
      a. Terminology: Match schedules as closely as possible.
      b. Data:
         1) Name and plan number.
         2) Equipment service.
         3) Design capacity.
         4) Other design parameters such as pressure drop, entering and leaving
            conditions, and speed.
      c. Location: Accessible and visible.
      d. Size: 2-1/2 by 4 inches for control devices, dampers, and valves; 4-1/2 by 6
         inches for equipment.
   7. Equipment Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate
   engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine
   subcore, unless otherwise indicated. Fabricate in sizes required for message. Provide
   holes for mechanical fastening.
      a. Data: Instructions for operation of equipment and for safety procedures.
      b. Engraving: Manufacturer's standard letter style, of sizes and with terms to match
         equipment identification.
      c. Thickness: [1/8 inch], unless otherwise indicated.
d. **Thickness:** 1/16 inch for units up to 20 sq. in. or 8 inches in length, and 1/8 inch for larger units.

8. **Warning Tags:** Preprinted or partially preprinted, accident-prevention tags; of plasticized card stock with matte finish suitable for writing.
   a. **Size:** Approximately 4 by 7 inches.
   b. **Fasteners:** Reinforced grommet and wire or string.
   c. **Nomenclature:** Large-size primary caption such as DANGER, CAUTION, or DO NOT OPERATE.
   d. **Color:** Yellow background with black lettering.

9. **Access Panel and Door Markers:** 1/16-inch thick, engraved laminated plastic, with abbreviated terms and numbers corresponding to identification. Provide 1/8-inch center hole for attachment. Self-tapping, stainless-steel screws or contact-type, permanent adhesive.

D. **Flow arrows** shall be solid black. Arrows shall be six (6) inches long by two (2) inches wide.

E. **Do color coding of pipes** with two (2) inch wide bands according to color schedule to be issued by the Owner during the progress of the work.

F. **Labeling of new systems added to existing systems** shall be consistent with the existing numbering system and terminology. Do not use valve numbers that have already been used.

G. **Provide typewritten master lists** in Operating and Maintenance Instruction Manuals; and shop equipment numbers on Record Prints and sepias.

H. **Identification** shall be consistent with Owner’s standard methods of identification.

I. **Provide 1-1/2 inch diameter, 1/16 inch thick brass tags** with 3/8 inch die stamped black letters. Attach to valves with four (4) inch brass chains. Brass tags may be omitted on small valves which isolate a single piece of equipment such as unit heater, fan coil unit, and section of radiation.

### 2.9 PIPING INSULATION

A. **GLASS FIBER**

1. **Acceptable Manufacturers:**
   a. Knauf.
   b. Manville.
   c. Certainteed.

2. **Insulation:** ASTM C795; rigid, noncombustible, end grain adhered to jacket.
   a. **‘K’ value:** ASTM C177, 0.24 at 75 degrees F.
   b. **Maximum service temperature:** 650 degrees F.
   c. **Maximum moisture absorption:** 0.2 percent by volume.
   d. **All fittings** shall also be rigid, conformed pieces with integral vapor barrier; basis of design shall be Hamfab insert product.

3. **Vapor Barrier Jacket:**
   a. ASTM C921, White kraft paper with glass fiber yarn, bonded to aluminized film.
   b. **Moisture vapor transmission:** ASTM E96; 0.02 perm-inches.

4. **Tie Wire:** 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

5. **Vapor Barrier Lap Adhesive:**
   a. **Compatible with insulation.**

6. **Insulating Cement/Mastic:**
a. ASTM C195; hydraulic setting on mineral wool.

7. Fibrous Glass Fabric:
   a. Cloth: Untreated; 9 oz/sq yd weight.
   b. Blanket: 1.0 lb/cu ft density.
   c. Weave: 5x5 10x10 10x20.

8. Indoor Vapor Barrier Finish:
   a. Cloth: Untreated; 9 oz/sq yd weight.
   b. Vinyl emulsion type acrylic, compatible with insulation.

9. Outdoor Vapor Barrier Mastic:
   a. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

10. Outdoor Breather Mastic:
    a. Vinyl emulsion type acrylic or mastic, compatible with insulation, black color.

11. Insulating Cement:
    a. ASTM C449/C449M.

B. JACKETS
1. General: ASTM C 921, Type 1, unless otherwise indicated
2. PVC Plastic.
   a. PVC Jacket: High-impact, ultraviolet-resistant, UV-resistant PVC complying with
      ASTM D 1784, Class 16354-C; PVC; 20 mils thick; roll stock ready for shop or field
      cutting and forming.
   b. Adhesive: As recommended by insulation jacket material manufacturer.
   c. PVC Jacket Color: Off-White and Color-code jackets based on system. Color as
      selected by Architect.
   d. Standard PVC Fitting Covers
      1) Factory-fabricated fitting covers manufactured from 20-mil-thick, high-
      impact, ultraviolet-resistant PVC to match jacket if available; otherwise, field
      fabricate.
      2) Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves,
      flanges, unions, reducers, end caps, traps, mechanical joints, and P-traps.
3. Aluminum Jacket (Use on exterior applications): ASTM B209
   a. Thickness: 0.016 inch sheet.
   b. Finish: Smooth
   c. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
   d. Fittings: 0.016 inch thick die shaped fitting covers with factory attached protective
      liner.
   e. Metal Jacket Bands: 3/8 inch wide;

C. ACCESSORIES
1. Insulating Cement: ASTM C195; hydraulic setting mineral wool.
2. Adhesives, Sealers, and Protective Finishes: As recommended by insulation
   manufacturer for applications indicated.
3. Staples, Bands, Wires, and Cement: As recommended by insulation manufacturer for
   applications indicated.

2.10 EQUIPMENT INSULATION

A. ACCEPTABLE MANUFACTURERS
1. CertainTeed Corp.
2. Knauf Fiber Glass
3. Owens Corning Fiberglas Corp.

B. GLASS FIBER, FLEXIBLE
1. Insulation: ASTM C553; flexible, noncombustible.
   a. ‘K’ Value: ASTM C177 or ASTM C518, 0.24 at 75 degrees F.
b. Maximum Service Temperature: 450 degrees F.
c. Maximum Moisture Absorption: 0.2 percent by volume.
d. Density: 3.0 lb/cu ft.

2. Vapor Barrier Jacket:
   a. ASTM C921, Kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
   b. Moisture vapor transmission: ASTM E96; 0.02 perm.
   c. Secure with self-sealing longitudinal laps and butt strips.
   d. Secure with outward clinch expanding staples and vapor barrier mastic.

3. Tie Wire: 0.048 inch stainless steel with twisted ends on maximum 12 inch centers.

4. Vapor Barrier Lap Adhesive:
   a. Compatible with insulation.

5. Insulating Cement/Mastic:
   a. ASTM C195; hydraulic setting on mineral wool.

C. GLASS FIBER, RIGID
1. Insulation: ASTM C612 or ASTM C592; rigid, noncombustible.
   a. 'K' Value: ASTM C177 or ASTM C518, 0.24 at 75 degrees F.
   b. Maximum Service Temperature: 850 degrees F.
   c. Maximum Moisture Absorption: 0.1 percent by volume.
   d. Density: 3.0 lb/cu ft.

2. Vapor Barrier Jacket:
   a. Kraft paper reinforced with glass fiber yarn and bonded to aluminized film..
   b. Moisture vapor transmission: ASTM E96; 0.02 perm.
   c. Secure with self-sealing longitudinal laps and butt strips.
   d. Secure with outward clinch expanding staples and vapor barrier mastic.

3. Facing: 1 inch galvanized or stainless steel hexagonal wire mesh stitched onto both faces of insulation.

4. Vapor Barrier Lap Adhesive:
   a. Compatible with insulation.

5. Insulating Cement/Mastic:
   a. ASTM C195; hydraulic setting on mineral wool.

D. CELLULAR FOAM
1. Insulation: ASTM C534; flexible, cellular elastomeric, molded or sheet.
   a. 'K' Value: ASTM C177; 0.25 at 75 degrees.
   b. Minimum Service Temperature: -40 degrees F.
   c. Maximum Service Temperature: 220 degrees F.
   d. Maximum Moisture Absorption: ASTM D1056; 1.0 percent by volume.
   e. Moisture Vapor Transmission: ASTM E96; 0.05 perm-inches.

2. Elastomeric Foam Adhesive:
   a. Air dried, contact adhesive, compatible with insulation.

E. JACKETS
1. PVC Plastic:
      1) Minimum Service Temperature: -40 degrees F.
      2) Maximum Service Temperature: 150 degrees F.
      3) Moisture Vapor Transmission: ASTM E96; 0.002 perm-inches.
      4) Thickness: 30 mil.
      5) Connections: Pressure sensitive color matching vinyl tape.
   b. Covering Adhesive Mastic:
      1) Compatible with insulation.

2. Canvas Jacket: UL listed.

b. Lagging Adhesive:
   1) Compatible with insulation.

   a. Thickness: 0.016 inch sheet.
   b. Finish: Smooth.
   c. Joining: Longitudinal slip joints and 2 inch laps.

F. ACCESSORIES
1. Provide staples, bands, wires, tape, anchors, corner angles and similar accessories as recommended by insulation manufacturer for applications indicated.
2. Provide cements, adhesives, coatings, sealers, protective finishes, and similar compounds as recommended by insulation manufacturer for applications indicated.
3. Jacketing Material (Fiberglass & Calcium Silicate): Presized glass cloth jacketing material, not less than 7.8 ounces per square yard.

2.11 AUTOMATIC TEMPERATURE CONTROLS – FACILITIES MANAGEMENT SYSTEM

A. ACCEPTABLE MANUFACTURERS
   a. Alerton (Existing system) as provided by Control Technologies Inc.

B. EXTENSION OF EXISTING BUILDING AUTOMATION SYSTEM
   1. The work shall be an extension of the existing facilities management system. Provide all necessary components for a complete operational system.
   2. Contractor shall become familiar with existing FMS sequences and shall coordinate all new sequences with the Owner’s existing FMS protocol.
   3. Provide new or updated graphics and User Interface software as necessary to control the new components from the existing User Interface.
   4. Extend the existing Local Area Network as necessary.
   5. Controls shall be provided by Control Technologies Inc. of New Hampshire.

C. GENERAL
   1. The Automatic Temperature Control (ATC) Contractor shall be regularly engaged in the engineering, programming, installation and service of total integrated Facilities Management Systems (FMS) of similar size, scope and complexity to the FMS specified in this Contract.
   2. The ATC Contractor shall have a branch facility within a 50-mile radius of the job site supplying complete maintenance and support services on a 24 hour, 7-day-a-week basis. This branch facility shall provide the work for this project. This support facility shall have spare parts and all necessary test and diagnostic equipment required to install, commission and service the specified FMS.
      a. The ATC sub contractor shall provide as part of the base contract a maximum of 24 hours response time to any issues reported by the owner during the warranty period.
      b. As part of an alternate contract, provide a maximum of 4 hours response time to any issues reported by the owner during the warranty period.
   3. As evidence and assurance of the contractor’s ability to support the Owner’s system with service and parts, the contractor must have been in the ATC business for at least the last ten (10) years and have successfully completed total projects of at least 10 times the value of this contract in each of the preceding five years.
   4. The FMS architecture shall consist of the products of a manufacturer regularly engaged in the production of Facility Management Systems, and shall be the manufacturer’s latest standard of design at the time of bid.
5. FMS Manufacturers system shall be Direct Digital Control (DDC) BACNET compatible. Comply with ASHRAE 135 for FMS control components.

D. SYSTEM DESCRIPTION
1. The Basis of Design Alertron (to match existing).
2. The FMS shall be a complete Direct Digital Control (DDC) system designed for use on Intranets and the Internet. This functionality shall extend into the equipment rooms. Primary nodes located in equipment rooms and similar shall be fully IT compatible devices that mount and communicate directly on the IT infrastructure.
3. All points of user interface shall be on standard PCs that do not require the purchase of any special software from the ATC manufacturer for use as a building operations terminal. The primary point of interface on these PCs will be a standard Web Browser such as Internet Explorer.
4. The ATC work shall consist of the provision of all labor, materials, tools, equipment, software, software licenses, software configurations and database entries, interfaces, wiring, tubing, installation, labeling, engineering, calibration, documentation, samples, submittals, testing, verification, training services, permits and licenses, transportation, shipping, handling, administration, supervision, management, insurance, temporary protection, cleaning, cutting and patching, warranties, services, and items as Specified in these Division documents which are required for the complete, fully functional and commissioned system.
   a. The ATC contractor shall field-install all components requiring field installation. All items required for a complete operating system, not provided by the manufacturer shall be by this contractor. The ATC contractor shall fully coordinate all control components, sequences and requirements with the manufacturer before submitting his shop drawings.
   b. The ATC contractor shall provide all interlock wiring and controls between the energy recovery units and their associated air cooled condensing units.
5. Provide a complete, neat and workmanlike installation. Use only manufacturer employees who are skilled, experienced, trained, and familiar with the specific equipment, software and configurations to be provided for this Project.
6. Manage and coordinate the ATC work in a timely manner in consideration of the Project schedules. Coordinate cooperatively with the associated work of other trades so as to assist the progress and not impede or delay the work of associated trades.
7. The FMS as provided shall incorporate, at minimum, the following integrated features, functions and services:
   a. Operator information, alarm management and control functions at User Interface without the need to purchase special software from the ATC manufacturer for those consoles.
   b. Enterprise-level information and control functions.
   c. Information management including monitoring, transmission, archiving, retrieval, and reporting functions.
   d. Diagnostic monitoring and reporting of FMS functions.
   e. Offsite monitoring and management
   f. Energy management
8. The FMS shall be designed entirely for use on intranets and internets. All networking technology used at the Tier 1 level shall be off the shelf, industry standard technology fully compatible with other owner provided networks in the facility.
9. All aspects of the user interface shall be via browsers. Any PCs used as User Interface points shall not require any more than the software indicated under User Interface in order to provide the complete user interface as described throughout this section.
10. The user interface will be complete as described herein, providing complete tool sets, operational features, multi- panel displays, and other display features. Systems which merely provide HTML based web pages as the User Interface will not be acceptable.
11. The primary components of the system will be the Control Units located at the highest level of the network architecture.
12. The FMS shall consist of a number of control units and associated equipment connected by industry standard network practices. All communication between control units shall be by digital means only.

13. The FMS network shall at minimum comprise of the following:
   a. Network processing, data storage and communication equipment.
   b. Routers, bridges, switches, hubs, modems and like communications equipment.
   c. Active processing Nodes including field panels.
   d. Intelligent and addressable elements and end devices.
   e. Third-party equipment interfaces.
   f. Other components required for a complete and working FMS.

14. All FMS features shall be accessible via Enterprise Intranet and Internet browser with equivalent FMS access control for user access.

15. The FMS shall support auto-dial/auto-answer communications to allow FMS nodes to communicate with other remote FMS Nodes via standard telephone lines - DSL or voice grade.

16. Provide licenses for all software residing in the FMS and transfer these licenses to the Owner prior to completion.

17. Power Fail / Auto Restart
   a. Provide for the automatic orderly and predefined shutdown of parts or all of the FMS following total loss of power to parts or all of the FMS.
   b. Provide for the automatic orderly and predefined startup of all parts of the FMS following total loss of power to those parts or all of the FMS. Archive and annunciate time and details of restoration.
   c. Provide for the orderly and predefined scheduling of controlled return to normal, automatically time scheduled, operation of controlled equipment as a result of the auto restart processes.
   d. Maintain the FMS real-time clock operation during periods of power outage for a minimum of 72 hours.

18. Downloading And Uploading
   a. Provide the capability to generate FMS software-based sequences, database items and associated operational definition information and user-required revisions to same at the User Interface, and the means to download same to the associated control units.

E. SUBMITTALS
   1. Shop Drawings, Product Data, and Samples
   2. The ATC Contractor shall submit a list of all shop drawings with submittal dates within 30 days of contract award.
   3. Submittals shall be in defined packages. Each package shall be complete and shall only reference itself and previously submitted packages. The packages shall be as approved by the Architect for Contract compliance.
   4. Organize FMS submittal within the following Three basic sections: 1. Component factory data sheets, component-specific diagrams, and component schedules; 2. Systems sequences, and system diagrams; and 3. Graphic User Interface (GUI) screen graphics. Provide full table of contents indicating specific page-number or drawing-number location of each component type, component schedule, system sequence, system diagram, and each GUI screen graphic.
   5. Equipment and systems requiring approval of local authorities must comply with such regulations and be approved. Filing shall be at the expense of the ATC Contractor where filing is necessary. Provide a copy of all related correspondence and permits to the Architect.
   6. At a minimum, submit the following:
      a. FMS network architecture diagrams including all nodes and interconnections.
      b. Detailed coordinated controls submittal including any packaged factory supplied controls and the ATC contractor supplied controls.
c. Thermostat and other controls and sensor locations shall be indicated on the project coordination drawing submittal.
d. Schematics, sequences and flow diagrams.
e. Points schedule for each real point in the FMS, including: Tag, Point Type, System Name and Display Units. [Node Type, Address, Cable Destination, Module Type, Terminal ID, Panel, Slot Number, Reference Drawing, and Cable Number.]
f. Samples of Graphic Display screen types and associated menu penetrations to show hierarchy and functional interrelationships.
g. Detailed Bill of Material list for each Node, identifying quantity, part number, description, and optional features.
h. Control Valve Schedules including a separate line for each valve and a column for each of the valve attributes: Code Number, Configuration, Fail Position, Pipe Size, Valve Size, Body Configuration, Close off Pressure, Capacity, Valve CV, Calculated CV, Design Pressure, Actual Pressure, and Actuator Type.
i. Details of all FMS interfaces and connections to the work of other trades.
j. Product data sheets for all products including software.
k. Training provided, including outlines for each session.

F. RECORD DOCUMENTATION
1. Operation and Maintenance Manuals shall be provided to the Owner's Representative upon completion of the project. The entire Operation and Maintenance Manual shall be furnished on Compact Disc media, and include the following for the FMS provided:
   a. Table of contents.
   b. As-built system record drawings. Computer Aided Drawings (CAD) record drawings shall represent the as-built condition of the system and incorporate all information supplied with the approved submittal. Include locations of all thermostats and other controls and sensors.
   c. Manufacturers product data sheets for all products including software.
   d. System Operator's manuals.
   e. Archive copy of all site-specific databases and sequences.
   f. network diagrams.
   g. Wiring termination schedules.
   h. Interfaces to all third-party products and work by other trades.
2. The Operation and Maintenance Manual CD shall be self-contained, and include all necessary software required to access the project record drawings and data sheets. A logically organized table of contents shall provide dynamic links to view and print all project record drawings and product data sheets. Viewer software shall provide the ability to display, zoom, and search all documents. The CD-ROM(s) shall contain adequate space for future system updates.
3. On-line Documentation: After completion of all the tests and adjustments listed above, the contractor shall install the following information on the FMS:
   a. "AS BUILT" drawing files
   b. Detailed catalog data on all installed system components with address and phone number of factory repair service.

G. WARRANTY
1. Provide a one-year labor and material warranty on the FMS as part of the base scope of work.
2. Provide an additional one year labor and material warranty for a total of two years of coverage as an alternate.
3. If within twelve (12) months from the date of acceptance of product, upon written notice from the owner, it is found to be defective in operation, workmanship or materials, it shall be replaced, repaired or adjusted at the option of the ATC Contractor at the cost of the ATC Contractor.
4. Maintain an adequate supply of materials within 100 miles of the Project site such that replacement of key parts and labor support, including programming. Warranty work shall be done during ATC Contractor’s normal business hours.

5. Maintain an on-site record of all work done, all items removed from site, all items returned to site, all new replacement items installed and all remedial programming and database entry work undertaken including software revisions installed. Maintain a record of all recalibrations required as a result of Warranty service.

H. COMMISSIONING
1. Refer to Part 1, Standard Reporting Requirements.
2. Fully commission all aspects of the Facility Management System work.
3. Acceptance Check Sheet
   a. Prepare a check sheet that includes all points for all functions of the FMS
   b. Submit the check sheet to the Engineer for approval one month prior to testing.
   c. Complete the check sheet for all items and functions of the FMS and initial each entry with time/date as record of having fully calibrated and tested the FMS. Submit to Engineer.
4. The Engineer will use the check sheet as the basis for acceptance testing with the ATC Contractor.
5. Provide all necessary specialist labor, materials and tools to demonstrate to the Engineer that the FMS has been commissioned and is operating in compliance with the contract. Prepare a list of noted deficiencies signed by both the Engineer and the ATC Contractor.
6. Promptly rectify all listed deficiencies and submit to the Engineer that this has been done.

I. Distributed Web-Based User Interface, or User Interface
1. All features and functions defined in this ATC specification section as accessible via a user interface shall be available to a user on any facility computer connected directly to the network, or any computer connected to the internet via a wide area or virtual private network (WAN/VPN) to the automation network, and shall be conformed to the following specifications.
   a. The software shall run on the Microsoft Internet Explorer (6.0 or higher) browser and support the following functions:
      1) Configuration
      2) Commissioning
      3) Data Trending and Archiving
      4) Monitoring
      5) Alerting/Alarming
      6) Commanding
      7) System Diagnostics

J. CONTROL UNITS
1. Units: Modular in design and consisting of processor board with programmable RAM memory, local operator access and integral interface equipment.
2. Memory shall be backed up with non-volatile EEPROM.
3. Control Units Functions:
   a. Monitor or control each input/output point.
   b. Completely independent with hardware clock/calendar and software to maintain control independently.
   c. Acquire, process, and transfer information to User Interface or other control units on network.
   d. Accept, process, and execute commands from other control unit’s or devices or User Interface.
   e. Access both data base and control functions simultaneously.
   f. Record, evaluate, and report changes of state or value that occur among associated points. Continue to perform associated control functions regardless of status of network.
g. Perform in stand-alone mode:
   1) Start/stop.
   2) Duty cycling.
   3) Automatic Temperature Control.
   4) Demand control via a sliding window, predictive algorithm.
   5) Event initiated control.
   6) Calculated point.
   7) Scanning and alarm processing.
   8) Full direct digital control.
   9) Trend logging.
  10) Global communications.
  11) Maintenance scheduling.

4. Global Communications:
   a. Broadcast point data onto network, making that information available to all other system control units.
   b. Transmit any or all input/output points onto network for use by other control units and utilize data from other control units.

5. Input/Output Capability:
   a. Discrete/digital input (contact status).
   b. Discrete/digital output.
   c. Analog input.
   d. Analog output.
   e. Pulse input (5 pulses/second).
   f. Pulse output (0-655 seconds in duration with 0.01 second resolution).

6. Monitor, control, or address data points. Mix shall include analog inputs, analog outputs, pulse inputs, pulse outputs and discrete inputs/outputs, as required. Install control unit's with minimum 30 percent spare capacity.

7. Point Scanning: Set scan or execution speed of each point to operator selected time from 1 to 250 seconds.

8. Upload/Download Capability: Download from or upload to using the User Interface. Upload/Download time for entire control unit database maximum 10 seconds on hard wired LAN, or 60 seconds over voice grade phone lines.

9. Test Mode Operation: Place input/output points in test mode to allow testing and developing of control algorithms on line without disrupting field hardware and controlled environment. In test mode:
   a. Inhibit scanning and calculation of input points. Issue manual control to input points (set analog or digital input point to operator determined test value) from workstation.
   b. Control output points but change only data base state or value; leave external field hardware unchanged.
   c. Enable control actions on output points but change only data base state or value.

10. Local display and adjustment panel: [Portable] [or] [Integral to] control unit, containing digital display, and numerical keyboard. Display and adjust:
   a. Input/output point information and status.
   b. Controller set points.
   c. Controller tuning constants.
   d. Program execution times.
   e. High and low limit values.
   f. Limit differential.
   g. Set/display date and time.
   h. Control outputs connected to the network.
   i. Automatic control outputs.
   j. Perform control unit diagnostic testing.
   k. Points in "Test" mode.
11. Each Control unit shall be equipped with the necessary un-interruptible power such that it will not cease operation during minor power outages, including those that occur upon transfer to emergency generator or other local power source not provided by the utility.

K. LOCAL AREA NETWORKS (LAN)
1. Provide communication between control units over local area network (LAN).
2. LAN Capacity: Not less than 60 stations or nodes.
4. LAN Data Speed: Minimum 10 Mbs.
6. Transmission Median: Fiber optic or single pair of solid 24 gauge twisted, shielded copper cable.
7. Network Support: Time for global point to be received by any station, shall be less than 3 seconds. Provide automatic reconfiguration if any station is added or lost. If transmission cable is cut, reconfigure two sections with no disruption to system's operation, without operator intervention.

L. LOAD CONTROL PROGRAMS
2. Demand Limiting:
   a. Monitor total power consumption per power meter and shed associated loads automatically to reduce power consumption to an operator set maximum demand level.
   b. Input: Pulse count from incoming power meter connected to pulse accumulator in control unit.
   c. Forecast demand (kW): Predicted by sliding window method.
   d. Automatically shed loads throughout the demand interval selecting loads with independently adjustable on and off time of between one and 255 minutes.
   e. Demand Target: Minimum of 3 per demand meter; change targets based upon (1) time, (2) status of pre-selected points, or (3) temperature.
   f. Load: Assign load shed priority, minimum "ON" time and maximum "OFF" time.
   g. Limits: Include control band (upper and lower limits).
   h. Output advisory if loads are not available to satisfy required shed amount, advise shed requirements [and requiring operator acknowledgement.
3. Automatic Time Scheduling:
   a. Self-contained programs for automatic start/stop/scheduling of building loads.
   b. Support up to seven (7) normal day schedules, seven (7) "special day" schedules and two (2) temporary day schedules.
   c. Special days schedule shall support up to 30 unique date/duration combinations.
   d. Any number of loads assigned to any time program; each load can have individual time program.
   e. Each load assigned at least 16 control actions per day with 1 minute resolution.
   f. Time schedule operations may be:
      1) Start.
      2) Optimized Start.
      3) Stop.
      4) Optimized Stop.
      5) Cycle.
      6) Optimized Cycle.
   g. Minimum of 30 holiday periods up to 100 days in length may be specified for the year.
   h. Create temporary schedules.
      i. Broadcast temporary "special day" date and duration.
4. Start/Stop Time Optimization:
a. Perform optimized start/stop as function of outside conditions, inside conditions, or both.
b. Adaptive and self-tuning, adjusting to changing conditions unattended.
c. For each point under control, establish and modify:
   1) Occupancy period.
   2) Desired temperature at beginning of occupancy period.
   3) Desired temperature at end of occupancy period.

5. Night Setback/Setup Program: Reduce heating space temperature setpoint or raise cooling space temperature setpoint during unoccupied hours; in conjunction with scheduled start/stop and optimum start/stop programs.

6. Calculated Points: Define calculations and totalization computed from monitored points (analog/digital points), constants, or other calculated points.
   a. Employ arithmetic, algebraic, Boolean, and special function operations.
   b. Treat calculated values like any other analog value, use for any function that a "hard wired point" might be used.

7. Event Initiated Programming: Event may be initiated by any data point, causing series of controls in a sequence.
   a. Define time interval between each control action between 0 to 3600 seconds.
   b. Output may be analog value.
   c. Provide for "skip" logic.
   d. Verify completion of one action before proceeding to next. If not verified, program shall be able to skip to next action.

8. Direct Digital Control: Each control unit shall provide Direct Digital Control software so that the operator may customize control strategies and sequences of operation by defining the appropriate control loop algorithms and choosing the optimum loop parameters.
   a. Control loops: Defined using "modules" that are analogous to standard control devices.
   b. Output: Paired or individual digital outputs for pulse-width modulation, and analog outputs, as required.
   c. Firmware:
      1) PID with analog or pulse-width modulation output.
      2) Floating control with pulse-width modulated outputs.
      3) Two-position control.
      4) Primary and secondary reset schedule selector.
      5) Hi/Lo signal selector.
      6) Single pole double throw relay.
      7) Single pole double throw time delay relay with delay before break, delay before make and interval time capabilities.
   d. Direct Digital Control loops: Downloaded upon creation or on operator request. On sensor failure, program shall execute user defined failsafe output.
   e. Display: Value or state of each of the lines which interconnect DDC modules.

9. Fine Tuning Direct Digital Control PID or floating loops:
   a. Display information:
      1) Control loop being tuned
      2) Input (process) variable
      3) Output (control) variable
      4) Setpoint of loop
      5) Proportional band
      6) Integral (reset) Interval
      7) Derivative (rate) Interval
   b. Display format: Graphic, with automatic scaling; with input and output variable superimposed on graph of "time" vs "variable".

10. Trend logging:
    a. Each control unit will store samples of control unit's data points.
    b. Minimum of 7 days historical data shall be stored.
c. Update file continuously at discretely assignable intervals.
d. Automatically initiate upload request and then store data on hard disk.
e. Time synchronize sampling at operator specified times and intervals with sample resolution of one minute.
f. Co-ordinate sampling with on/off state of specified point.
g. Display trend samples on work station in graphic format. Automatically scale trend graph with minimum 60 samples of data in plot of time vs data.
h. Provide trending operations during the commissioning process as needed to troubleshoot system dis-functions.

M. PROGRAMMING APPLICATION FEATURES
1. Trend Point:
   a. Sample up to 500 points, real or computed, with each point capable of collecting samples at intervals specified in minutes, hours, days, or month.
   b. Output trend logs as line graphs or bar graphs. Output graphic on terminal, with each point for line and bar graphs designated with a unique [pattern] [color], vertical scale either actual values or percent of range, and horizontal scale time base. Print trend logs up to 12 columns of one point/column.

2. Alarm Messages:
   a. Allow definition of messages.
   b. Assign alarm messages to system messages including point's alarm condition, point's off-normal condition, totaled point's warning limit, hardware elements advisories.
   c. Output assigned alarm with "message requiring acknowledgement".
   d. Operator commands include define, modify, or delete; output summary listing current alarms and assignments; output summary defining assigned points.

3. Weekly Scheduling:
   a. Automatically initiate equipment or system commands, based on preselected time schedule for points specified.
   b. Provide program times for each day of week, per point, with one minute resolution.
   c. Automatically generate alarm output for points not responding to command.
   d. Provide for holidays, minimum of 366 consecutive holidays.
   e. Operator commands:
      1) System logs and summaries.
      2) Start of stop point.
      3) Lock or unlock control or alarm input.
      4) Add, delete, or modify analog limits and differentials.
      5) Adjust point operation position.
      6) Change point operational mode.
      7) Open or close point.
      8) Enable/disable, lock/unlock, or execute interlock sequence or computation profile.
      9) Begin or end point totalization.
     10) Modify totalization values and limits.
     11) Access or secure point.
     12) Begin or end HVAC or load control system.
     13) Modify load parameter.
     14) Modify demand limiting and duty cycle targets.
   f. Output summary: Listing of programmed function points, associated program times, and respective day of week programmed points by software groups or time of day.

4. Interlocking:
   a. Permit events to occur, based on changing condition of one or more associated master points.
   b. Binary contact, high/low limit of analog point or computed point shall be capable of being utilized as master. Same master may monitor or command multiple slaves.
c. Operator commands:
   1) Define single master/multiple master interlock process.
   2) Define logic interlock process.
   3) Lock/unlock program.
   4) Enable/disable interlock process.
   5) Execute terminate interlock process.
   6) Request interlock type summary.

N. SENSORS
1. Electronic Sensors: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.
2. Thermistor temperature sensors as follows:
   a. Accuracy: Plus or minus 0.36 deg F at calibration point.
   b. Wire: Twisted, shielded-pair cable.
   c. Insertion Elements in Ducts and equipment: Single point, 18 inches long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft..
   d. Averaging Elements in Ducts and equipment: 72 inches long, flexible use where prone to temperature stratification or where ducts are larger than 9 sq. ft.; length as required.
   e. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches.
   f. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
   g. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.
   a. Accuracy: Plus or minus 0.2 percent at calibration point.
   b. Wire: Twisted, shielded-pair cable.
   c. Insertion Elements in Ducts: Single point, 18 inches long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft..
   d. Averaging Elements in Ducts: 72 inches long, flexible; use where prone to temperature stratification or where ducts are larger than 9 sq. ft.; length as required.
   e. Insertion Elements for Liquids: Brass socket with minimum insertion length of 2-1/2 inches.
   f. Room Sensors refer to construction and accessories below.
   g. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
4. Pressure Transmitters: Direct acting for gas, liquid, or steam service; range suitable for system; proportional output 4 to 20 mA.
5. Equipment operation sensors as follows:
   a. Status Inputs for Pumps: Differential-pressure switch piped across pump with adjustable pressure-differential range of 8 to 60 psig
   b. Status Inputs for Electric Motors: Current-sensing relay with current transformers, adjustable and set to 175 percent of rated motor current.
7. Water-Flow Switches: Pressure-flow switches of bellows-actuated mercury or snap-acting type, with appropriate scale range and differential adjustment, with stainless-steel or bronze paddle. For chilled-water applications, provide vapor proof type.

O. HYDRONIC FLOW METERS
a. Construction: Bronze, brass, or factory-primed steel; with brass fittings and attached tag with flow conversion data. Include ends threaded for 2” and smaller elements and flanged or welded for 2-1/2 and larger elements.

b. Pressure Rating: 250 psig.

c. Temperature Rating: 250 deg F.

d. Acceptable Manufacturers:
   1) Gerand

P. AUTOMATIC CONTROL VALVES:
1. All automatic control valves shall be fully proportioning with modulating plug or V-port inner guides, unless otherwise specified. The valves shall be quiet in operation and fail-safe in either normally open or normally closed position in the event of power failure. All valves shall be capable of operation in sequence when required by the sequence of operation. All control valves shall be sized by the control manufacturer and shall be guaranteed to meet the heating loads as specified. All control valves shall be suitable for the pressure conditions involved. Valve operators shall be of the electronic actuating type and be fully modulating or two position type as indicated under the sequence of operation. Body pressure rating and connection type (screwed or flanged) shall conform to pipe schedule in this specification.
   a. All valves sequenced with other valves, or control devices, shall be equipped with pilot positioners.
   b. Hot water control valves shall be single-seated type with equal percentage flow characteristics. The valve discs shall be composition type with bronze trim.

Q. VALVE OPERATORS:
1. ACCEPTABLE MANUFACTURERS:
   a. Belimo
2. Valve operator shall be electronic actuator type, fully-modulating or two-position type as indicated in the sequences of operation.
3. Direct-mount, spring return, bi-directional
4. Operating conditions -40 deg. F to 131 deg. F.
5. NEMA 2 aluminum enclosure.
6. 24V / 60 Hz power, unless noted otherwise on electrical drawings.
7. Locking manual override with auto release and crank storage.
8. Proportional actuators shall accept a 0 to 10 VDC or 0 to 20 mA control input and provide a 2 to 10 VDC or 4 to 20 mA operating range. An actuator capable of accepting a pulse width modulating control signal and providing full proportional operation of the damper is acceptable. All actuators shall provide a 2 to 10 VDC position feedback signal.
9. All 24 VAC/VDC actuators shall operate on Class 2 wiring and shall not require more than 10 VA for AC or more than 8 watts for DC applications. Actuators operating on 120 VAC power shall not require more than 10 VA. Actuators operating on 230 VAC power shall not require more than 11 VA.
10. Actuators shall be Underwriters Laboratories Standard 873 listed and Canadian Standards Association Class 4813 02 certified as meeting correct safety requirements and recognized industry standards.
11. Actuators shall be designed for a minimum of 60,000 full stroke cycles at the actuator’s rated torque and shall have a 2-year manufacturer’s warranty, starting from the date of installation. Manufacturer shall be ISO9001 certified.
12. ACCESSORIES
   a. Shaft Clamp
   b. Provide with linkage bars where indicated in the documents or where required in the field to facilitate 3-way valve operation.
   c. Electronic overload or digital rotation sensing circuitry to prevent damage throughout the entire actuator rotation. End switch and magnetic clutch are not acceptable.
R.  DDC COMPONENT INSTALLATION

1. EXAMINATION
   a. Verify that conditioned power supply is available to the control units and to the User Interfaces within the owner facility. Verify that field end devices, and wiring is installed prior to installation proceeding.

2. INSTALLATION
   a. Install control units and other hardware in position on permanent walls where not subject to excessive vibration.
   b. Contractor shall group and centrally locate all control transformers. Refer to electrical drawings for designated locations.
   c. Install software in control units and in operator work station. Implement all features of programs to specified requirements and appropriate to sequence of operation.
   d. Provide with 120v AC, 15 amp dedicated emergency power circuit to each programmable control unit.
   e. All electric wiring and wiring connections, either line voltage or low voltage, required for the installation of the temperature control system, as herein specified, shall be provided by the temperature control contractor unless specifically shown on the electrical drawings or called for in the electrical specifications. The wiring installation shall be in accordance with National and Local Codes and with the Electrical portion of these specifications. All wiring shall be run concealed wherever possible. Exposed wiring shall be run in raceways. Raceways shall be Wiremold 200 series with all elbows, raceways, covers, mounting stops, box extensions and wiring for a complete and neat installation.
   f. All wiring shall comply with the requirements of the DIVISION 26 – ELECTRICAL.

3. MANUFACTURER’S FIELD SERVICES
   a. Start and commission systems. Allow sufficient time for start-up and commissioning prior to placing control systems in permanent operation.
   b. Provide service engineer to instruct Owner's representative in operation of systems plant and equipment period as specified in INSTRUCTIONS TO OWNER paragraph of these specifications.
   c. Provide basic operator training for persons on data display, alarm and status descriptors, requesting data, execution of commands and request of logs. Include dedicated instructor time as specified in INSTRUCTIONS TO OWNER paragraph of these specifications. Provide training on site.

S. SEQUENCE OF OPERATION

1. GENERAL
   a. All setpoints and time delays mentioned in the following sequences shall be adjustable by the operator without any hardware or software revisions.
   b. All sequences of operations shall be performed by direct digital control (DDC) panels. Software in the DDC panels shall determine occupied, and unoccupied mode of operation. Names for all points and variables shall be coordinated with owner and/or Engineer.
   c. Fail-safe positions are position that devices will go to when de-energized: no = normally open, nc = normally closed. All heating coils (pre-heat, heating and reheat) shall have two way control valve arrangement with the normally open position (stay open on power failure) to the coil.
   d. Whenever a piece of HVAC equipment is off per the control system or main power is disconnected, the control devices for the unit shall go to their fail-safe position.
   e. All cooling coils shall have two way control valve arrangement and shall fail in the closed position (stay closed on power failure) to the coil.
   f. Whenever a piece of HVAC equipment is off per the control system or main power is disconnected, the control devices for the unit shall go to their fail-safe position.
   g. All control points indicated in the following sequences shall be capable of sending an alarm to the system should the value read beyond the range of the adjustable minimum and maximum set points.
2. CHILLER PLANT CONTROLS
   a. User Interface: Display the following data in addition to chiller plant data currently displayed on the existing FMS: Add data requirements in coordination with chiller manufacturers. Provide all required system points (and associated sensors and equipment) to display the following (at a minimum).

   1) Chiller’s on-off status.
   2) Entering chilled-water temperature.
   3) Entering chilled-water temperature set point.
   4) Leaving chilled-water temperature.
   5) Chilled water control valve position.
   6) Chilled water flow rate through chiller.
   7) Chilled-water pressure drop through chiller.
   8) Chiller power demand.
   9) Chiller cooling percentage.

   b. Chiller shall not start until flow is proved by water flow switch wired to chiller control panel. Flow switch shall be furnished and wired by this contractor.

   c. Chilled water pumps, primary pumps and condenser water pumps shall be interlocked with chiller and shall not be energized unless chiller is energized. Standby pump shall run upon failure of any of the above.

   d. The ATC contractor shall install any temperature controls supplied by chiller manufacturer including but not limited to discharge and return chilled water temperature sensors, flow switches, alarm points, etc.

   e. This contractor shall wire from a common alarm contact in the chiller control panel to the FMS to alarm if any chiller alarms are activated.

   f. This contractor shall provide all control wiring associated with the chemical water treatment system for the cooling tower and for the refrigerant monitoring system.

   g. Change-Over: The controls shall include an automatic change-over from the primary (CH-1) to the existing water cooled chiller CH-2. The changeover shall be able to be automatic based on an operator defined schedule or through manual activation via the FMS.

   1) In addition to the above sequences, the standby chiller shall be activated if any of the following occurs:
      a) The duty chiller fails to run after a 15 second delay from being commanded on. An alarm shall be generated as per below section.
      b) The primary chilled water return temperature goes 5 degrees F above its setpoint for 30 minutes, indicating high cooling demand.

   h. Safeties

   1) The control system shall initiate an alarm, describing the alarm if any of the following conditions are met (all setpoints and time periods below shall be adjustable by user from the FMSs central console). Whenever a unit is shut down because of one of the safeties, the control system shall retain in memory the reading and setpoint of each device to help the operator in isolating the reason for the problem. All control system sensors shall have a high and low software alarm limit to indicate temperature problems or a faulty sensor.
      a) Any alarm from the chiller control panel is initiated.
      b) The chilled water supply or return temperature goes 5 degrees F below or above its setpoint for five minutes.
      c) The chiller is commanded to run and any time after a fifteen second delay the control system senses no running status via the chiller control panel.
      d) Any pump is commanded to run and any time after a 15 second delay the control system senses no running status via the pumps current transformer relays (ct).
e) Flow is sensed via flow switch in overflow line from remote cooling tower sump for more than ten minutes.

i. The ATC contractor shall field-install all components requiring field installation. All items required for a complete operating system, not provided by the manufacturer shall be by this contractor. The ATC contractor shall fully coordinate all control components, sequences and requirements with the manufacturer before submitting his shop drawings.

2.12 HYDRONIC PIPING SYSTEMS

A. ASME COMPLIANCE:

B. PIPE AND FITTINGS
1. Pipe Size 2-1/2” and Larger: Black steel pipe; Schedule 40; wrought steel buttweld fittings; welded joints.

C. VALVES: Unless otherwise indicated provide valves as listed in the “VALVES” and “HYDRONIC SPECIALTIES” paragraphs of this specification.

2.13 HYDRONIC SPECIALTIES

A. SUBMITTALS
1. Product Data Sheets: For each type of Hydronic Specialty indicated.
2. Shop Drawings: Show all Hydronic Specialties on Coordination drawings. Refer to “COORDINATION DRAWINGS” this SECTION.

B. ASME COMPLIANCE:

C. COMBINATION BALANCING AND SHUT-OFF VALVES – 1” AND UNDER
1. Valves shall be of bronze body/brass ball construction with glass and carbon filled TFE seat rings.
2. Valves are to have differential pressure read-out ports across valve seat area. Read-out ports to be fitted with internal EPT inserts and check valves.
3. Valve bodies to have ¼” NPT tapped drain/purge port.
4. Valves to have memory stop feature to allow valve to be closed for service and then reopened to set point without disturbing balance position. All valves to have calibrated nameplates to assure specific valve settings.
5. Valves shall be designed for positive shut off.
6. Valves to be provided with preformed insulation to permit access for balance and read-out.
7. Provide extended stems for all valves in insulated piping systems. Stems shall extend to length necessary for full handle exposure outside of insulation system.
8. Valves to be Bell & Gossett Circuit Setter Plus or equivalent by Taco.

D. COMBINATION BALANCING AND SHUT-OFF VALVES – OVER 1”
1. Balancing valves shall be of the “Y” pattern globe style design. Valves shall offer a minimum of four full rotations of the handwheel for accurate adjustments and acceptable flow control ranges.
2. All balancing valves must exhibit an accuracy of ± 5% in the normal operating range of the valve.
3. All balancing valves shall have integral self-sealing metering ports for measuring differential pressure, flow rates and temperature.
4. All balancing valves must be capable of 100% shutoff at pressures up to 250 psi.
5. Valves shall have a hidden preset and tamperproof locking device to prevent unauthorized adjustment and to allow for a return to the original setting after shut off.
6. All balancing valves in sizes up to 2” shall have a digital handwheel for positioning and presetting accuracy. Sizes 2.5” and over shall have a vernier sleeve for readout.
7. Valves up to 2” shall have a drain fill connection with and integral stop valve.
8. Valves up to 2” shall be manufactured from die cast dezincification resistant copper alloy which does not require dielectric fittings. Valves over 2” shall be manufactured from cast iron with all wetted moving parts of dezincification resistant copper alloy.
9. Valves up to 2” to be provided with preformed insulation to permit access for balance and read-out.
10. Provide extended stems for all valves in insulated piping systems. Stems shall extend to length necessary for full handle exposure outside of insulation system.
11. Valves shall be by Tour & Anderson or equivalent by Nibco or Armstrong.

E. BALANCE COCKS
1. Threaded or Soldered Ends (as required) 2” and Smaller: Class 125, bronze body, bronze plug; screwdriver operated, straight or angle pattern.
2. ACCEPTABLE MANUFACTURERS
   a. American Air Filter Co.
   b. B&G ITT; Fluid Handling Div.
   c. Spirax Sarco Co.
   d. Taco, Inc.

F. AIR VENTS
2. Automatic: Float principle; stainless steel float and mechanism; cast iron body; 125 psi; 2 inch NPS inlet and outlet connections.
3. ACCEPTABLE MANUFACTURERS
   b. B&G ITT; Fluid Handling Div.
   c. Spirax Sarco Co.

G. LIQUID FLOW SWITCHES
1. Brass for wetted parts; packless construction; paddle with removable segments; vapor proof electrical compartment; switches for 115 volt, 60 Hz., 1 phase with 7.4 amp. rating.
2. ACCEPTABLE MANUFACTURERS
   a. McDonald & Miller ITT; Fluid Handling Div.

2.14 CHEMICAL WATER TREATMENT

A. MATERIALS
1. All chemicals shall be approved by the Federal Environmental Protection Agency.
2. System Cleaner:
   a. Liquid alkaline compound with emulsifying agents and detergents to remove grease and petroleum products; sodium tripoly phosphate and sodium molybdate.
3. Biocide
   a. Chlorine release agents such as sodium hypochlorite or calcium hypochlorite, or microbicides such as quarternary ammonia compounds, tributyl tin oxide, methylene bis (thiocyanate), or isothiazolones.
4. Closed System Treatment (Water):
a. Sequestering agent to reduce deposits and adjust pH; polyphosphate.
b. Corrosion inhibitors; liquid boron-nitrite, sodium nitrite and borax, sodium tolyltriazole, low molecular weight polymers, phosphonates, sodium molybdate, or sulphites.
c. Conductivity enhancers; phosphates or phosphonates.

2.15 PACKAGED AIR COOLED RECIPROCATING WATER CHILLER

A. ACCEPTABLE MANUFACTURERS
   1. Trane
   2. Carrier
   3. McQuay

B. GENERAL
   1. Provide factory assembled and tested air-cooled liquid chillers consisting of screw compressors, evaporator, air-cooled condenser section, thermal expansion valve, refrigeration accessories, and control panel. Construction and rating shall be in accordance with ANSI/ARI 550/590.
   2. Provide one air-cooled water chiller package having rated capacity as scheduled. Minimum capacity of chiller shall be 20% of rated capacity. All manufacturer options required to provide minimum performance shall be provided.
   3. Provide proper vibration isolation for associated piping & wiring according to manufacturer’s representatives.
   4. Provide with single-point power block.
   5. Provide low ambient performance accessories as required to enable chiller to reliably operate down to a minimum of 0 deg. F.
   6. Minimum chiller full load EER at ARI conditions shall be 10.2.

C. HOUSING
   1. The frame shall be heavy duty galvanized structural steel construction. The cabinet shall be fabricated from heavy gauge galvanized steel removable panels finished with corrosion and weather-resistant finish.
   2. Cabinet shall be capable of withstanding 500-hour salt spray test in accordance with ASTM B-117.

D. COMPRESSORS
   1. Multiple, semi-hermetic, twin screw type compressors, operating on HFC-134a. Compressors shall be direct drive. Motors shall be suction gas cooled.
   2. Provide reversible, positive displacement, oil pump lubrication system with oil charging valve, oil level sight glass, oil filter and magnetic plug on strainer, arranged to ensure adequate lubrication during starting, stopping, and normal operation.
   3. Provide compressor with fully modulating slide valve capacity control. Minimum range of capacity control shall be 100% to 20% of rated full load.

E. EVAPORATOR
   1. Provide integral evaporator of shell and tube type, seamless or welded steel construction with cast iron or fabricated steel heads, seamless copper tubes or red brass tubes with integral aluminum fins, rolled or silver brazed into tube sheets, or of plate to plate type.
   2. Heads on evaporator shall be removable with groove joint water connections.
   3. Provide multiple refrigerant circuits, minimum of two circuits.
   4. Design, test, and stamp refrigerant side for 220 PSIG maximum pressure, and water side for 300 PSIG working pressure in accordance with ANSI/ASME SEC 8.
5. Insulate with 0.75 inch minimum thick flexible expanded polyvinyl chloride insulation with maximum K value of 0.28.
6. Provide water drain connection and thermometer wells for temperature controller and low temperature cutout.
7. Provide water side vent connection and vent.
8. For low ambient protection, unit shall have factory installed cooler heater, and pumpout cycle to protect evaporator from ambient temperature freeze down to 0 deg F.
9. Evaporator shall be provided with factory installed flow switch.

F. CONDENSER
1. Provide condenser of copper tubes with aluminum plate fins. Fins shall be formed with tube collars and mechanically expanded with fin collars for full contact. Condenser coils shall be tested to minimum of 300 psig air pressure.
2. Tubes shall be cleaned dehydrated and sealed.
3. Casings shall be heavy gauge aluminum. Tube sheets shall be die formed and full collared for tube support. Headers to be constructed of heavy wall seamless copper tubing.

G. CONDENSER FANS
1. Provide direct drive propeller type with zinc plated chromate dipped blades or reinforced polymer construction. Fans shall be statically and dynamically balanced.
2. Air shall discharge vertically to minimize noise generation and air recirculation.
3. Fan blades shall be low-sound type with airfoil blade configuration.
4. Fans shall be located within a formed venturi and be provided with a polyvinyl covered fan guard.
5. Fan motors shall be 3 phase, 1140 RPM, vertical, direct drive motors with permanently lubricated ball bearings and overload protection.

H. ELECTRONIC EXPANSION VALVE
1. Electronic expansion valve controls refrigerant flow to the evaporator for different operating conditions.
2. Valve shall vary the orifice size based on internal chiller microprocessor controls.

I. LOW AMBIENT HEAD PRESSURE CONTROL
1. Unit shall be capable of running at outdoor ambient temperatures down to a minimum of 0 deg F.
2. Provide factory installed, solid state low ambient temperature head pressure control with condenser coil temperature sensor.
3. Provide factory installed wind baffles on unit.

J. REFRIGERANT CIRCUIT
1. Provide dual refrigerant circuits, factory supplied and piped.
2. Provide for each refrigerant circuit:
   a. Liquid line solenoid valve
   b. Filter dryer (replaceable core type)
   c. Liquid line sight glass and moisture indicator
   d. Thermal expansion valve for maximum operating pressure
   e. Charging valve
   f. Insulated suction line
   g. Discharge line check valve
   h. Compressor service valves on suction and discharge of each compressor
   i. Pressure relief device
   j. Provide additional refrigerant system service valves that allow for full isolation capability of the condenser(s).

K. CONTROLS
1. Provide provisions for DDC control as specified herein, and provisions for remote start/stop capabilities and run status light. Locate on chiller, mount steel control panel, containing starters, power and control wiring, molded case disconnect switch, factory wired with single-point power connection.

2. For each compressor, provide across-the-line starter, non-recycling compressor overload, starter relay, and control power transformer. Provide manual reset current overload protection.

3. Provide the following devices on a Nema 4X control panel face:
   a. Compressor(s) run lights
   b. System start/stop switch
   c. Control power fuse of circuit breaker
   d. Compressor(s) lead/lag switch

4. Provide the following safety controls with indicating lights arranged so that operating any one will shut down machine and require manual reset:
   a. Low chilled water temperature switch
   b. High discharge pressure switch for each compressor
   c. Low suction pressure switch for each compressor
   d. Oil pressure switch
   e. Flow switch in chilled water line
   f. Relay for remote mounted emergency shutdown
   g. Low ambient protection to energize evaporator heaters.
   h. Loss of refrigerant charge.
   i. Motor over-temperature
   j. Loss of phase

5. Provide the following operating controls:
   a. Chilled water temperature controller which modulates compressor(s) capacity.
   b. Adjustable off timer prevents compressor from short cycling.
   c. Automatic refrigerant circuit lead/lag control.
   d. Periodic pumpout timer to pump down on chilled water flow and high evaporator refrigerant pressure.
   e. Hot gas bypass sized for minimum compressor loading on all compressor circuits that bypasses hot refrigerant gas to evaporator.
   f. Automatic start/stop controls for chilled water pump(s).
   g. Single step demand-limit control activated by remote contact closure.

6. Provide pre-piped gauge board with pressure gauges for suction and discharge refrigerant pressures and oil pressures.

7. Provide alarm package with test button and indicating lights which indicate control circuit is energized and compressor is running and will light an indicating light upon detection of compressor malfunction, low chilled water temperature, or evaporator water flow failure.

8. Provide factory installed communication capability with a BACnet MS/TP or Ethernet network.

L. ADDITIONAL OPTIONS AND ACCESSORIES
   1. Provide stainless steel, unit mounted, exterior rated, non-fused disconnect switch for unit main power.

M. MANUFACTURERS FIELD SERVICES
   1. Prepare and start systems.
   2. Supply service of factory-trained representative for a period of one day to supervise testing, dehydration and charging of machine, start-up, and instruction on operation and maintenance to Owner.
PART 3 - EXECUTION

3.1 PROTECTION

A. Be responsible for the care and protection of all work included in this Section until it has been tested and accepted.

B. After delivery and before, during and after installation, protect all equipment, materials and systems from injury or damage of all causes, as well as from theft. Such loss or damage shall be made good without expense to the Owner.

C. Wherever factory finishes of paint, lacquer, baked enamel, etc., have been damaged or deteriorated during construction, use factory furnished painting materials and refinish or touch up the damage or deterioration, to the satisfaction of the Architect. Application shall be by skilled workers experienced in painting and finishing.

3.2 INSTALLATION OF EQUIPMENT - GENERAL

A. Install all equipment and products furnished and make system connections to such equipment in accordance with the manufacturer's instructions.

B. Provide adequate clearances around equipment to permit replacement, normal servicing and maintenance.

C. Install electrical devices furnished by manufacturer but not specified to be factory mounted.

D. Ground equipment: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

E. Install with required clearance for service and maintenance.

F. Locate all roof mounted equipment a minimum of 10'-0" from the edge of the roof to the service clearance requirement. Equipment can be located near to edge of roof if equipment screen, guard rail or parapet of code required height is provided.

G. Install piping adjacent to machine to allow service and maintenance.

3.3 CUTTING, PATCHING AND CORE DRILLING

A. This contractor shall perform all cutting, channeling and coring up to six (6) inches in diameter required for the work of this section.

B. Provide timely notification to other trades of openings required for mechanical work. Supply accurate details of location and size.

C. Obtain written approval of structural engineer before cutting through structural members.

3.4 WIRING
A. Where the mechanical contractor is to provide wiring including but not limited to wiring provided under the Automatic temperature controls paragraph of this specification, the wiring including conduit and materials, shall conform to the requirements of the National Electrical Code and DIVISION 26.

3.5 PAINTING
A. Supply ferrous metal work, except piping and galvanized steel ductwork, with at least one factory prime coat, or paint one prime coat on the job.
B. Clean and steel brush surfaces of welds. Then prime coat all steel supports and brackets.
C. On uninsulated piping, steel brush and prime coat welds.
D. Touch-up or repaint all surfaces damaged during shipment or installation and prepare surface for finish painting.
E. Paint with flat black, all surfaces visible behind air diffusers and grilles, including surfaces behind grilles provided by others to which sheetmetal connects.
F. Prime coat material and finish painting shall conform to Division 1.
G. Paint all exterior piping, supports, accessories, etc. that are not galvanized or stainless, with corrosion prevention coating system. Apply per manufacturers recommendations. Coordinate color with owner.

3.6 CONCRETE
A. Concrete required for the work of this section shall be carried out by the mechanical contractor.
B. Other concrete work required for the work of this section, including reinforcing steel and concrete required for inertia bases shall be carried out under the work of the architectural specification at the expense of the mechanical contractor.
C. This contractor shall supply and set in position floating reinforced concrete inertia bases, which are provided under the Vibration Isolation paragraph of this specification.

3.7 STEEL
A. Steel which is required for the work of this section, and is not shown on the structural or architectural drawings, shall be furnished and installed by this contractor under the requirements of the appropriate sections of the architectural specifications.
B. Steel shall have adequate strength to support equipment and materials during testing and under all operating conditions.
C. Support suspended equipment from the bottom or from manufacturer’s designated suspension points. Tanks and similar equipment with adequate beam strength shall be supported by saddles with a curvature to exactly match the equipment. Other equipment shall be supported continuously.
D. Steel supports exposed to weather or in contact with water or otherwise in a humid atmosphere shall be either galvanized after fabrication or fabricated from materials having approved corrosion resistance. Welds shall be brushed clean and a coat of rust inhibiting paint applied.

E. This contractor shall ensure that equipment is sufficiently rigid for point support by isolators specified in the VIBRATION ISOLATION paragraph of these specifications. Coordinate with supplier of vibration isolation and provide auxiliary structural support if required.

3.8 INSTALLATION OF PIPE AND PIPE FITTINGS

A. GENERAL
1. Hold piping close to walls, overhead construction, columns and other structural and permanent enclosure elements of building. Limit clearance to 2" where furring is shown for enclosure or concealment of piping, but allow for insulation thickness, if any. Where possible, locate insulated piping for 1" clearance outside insulation.
2. Install each run with minimum joints and couplings, but with adequate and accessible unions for disassembly and maintenance/replacement of valves and equipment.
3. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.
4. Anchor piping for proper direction of expansion and contraction.
5. Align piping accurately at connections, within 1/16" misalignment tolerance.
7. Fire and/or Smoke Barrier Penetrations: Maintain indicated fire/smoke rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.
8. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
9. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
10. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
11. Install piping at indicated slopes.
12. Install piping free of sags and bends.
13. Install fittings for changes in direction and branch connections.

B. WELDED JOINTS: Weld joints in accordance with recognized industry standards as follows:
1. Weld only when ambient temperature is above 0 deg. F.
2. Bevel pipe ends at a 37.5 deg. angle where possible, smooth rough cuts, and clean to remove slag, metal particles and dirt.
3. Use pipe clamps or tack weld joints with 1" long welds; 4 welds for pipe sizes to 10", 8 welds for pipe sizes 12" to 20".
4. Build up welds with stringer bead pass, followed by hot pass, followed by cover or filler pass. Eliminate valleys at center and edges of each weld. Weld by procedure which will ensure elimination of unsound or unfused metal, cracks, oxidation, blow-holes and nonmetallic inclusions.
5. Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, “Welding and Brazing Qualifications.”

C. FLANGED JOINTS: Match flanges within piping system, and at connections with valves and equipment. Clean flange faces and install gaskets. Tighten bolts to provide uniform compression of gaskets.
D. CLEANING, FLUSHING, INSPECTING  
1. Clean exterior surfaces of installed piping systems of superfluous materials, and prepare for application of specified coating (if any).  
2. Fill system with fresh water and add liquid alkaline compound with emulsifying agents and detergents to remove grease and petroleum products from piping. Circulate solution for a minimum of 24 hours. Drain, clean strainer screens, and refill with fresh water.  
3. Inspect each run of each system for completion of joints, supports and accessory items.

E. PIPING TESTS  
1. Test pressure piping in accordance with ASME B 31.  
2. Fill system with water. Provide temporary equipment for testing, including pump and gages. Test piping systems before insulation is installed and remove control devices before testing. Test each natural section of each piping system independently but do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating.  
3. Required test period is 2 hours.  
4. Test each piping system at 150% of operating pressure indicated, but not less than 25 psi test pressure.  
5. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drops exceeds 5% of test pressure.  
6. Repair piping systems sections that fail required test, by disassembly and reinstallation, using new materials to the extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.  
7. Drain test water from systems after testing and repair work has been completed.

3.9 INSTALLATION OF VIBRATION ISOLATION, SUPPORTS AND SEISMIC RESTRAINT

A. GENERAL  
1. Isolation, support and seismic restraint systems must be installed in strict accordance with the manufacturer's submittal data.  
2. Vibration isolators shall not cause any change of position of equipment resulting in stress on equipment connections.

B. EQUIPMENT INSTALLATION  
1. Equipment shall be isolated as indicated in TABLE A at the end of this section.  
2. Additional Requirements:  
   a. The minimum operating clearance under all bases shall be 1".  
   b. All bases shall be placed in position and supported temporarily by blocks or shims prior to the installation of the equipment, isolators and restraints.  
   c. Spring isolators shall be installed after all equipment is installed without changing equipment elevations.  
   d. After the entire installation is complete and under full operational load, the spring isolators shall be adjusted so that the load is transferred from the blocks to the isolators.  
   e. Remove all debris from beneath the equipment and verify that there are no short circuits of the isolation. The equipment shall be free in all directions.  
   f. Install equipment with flexibility in wiring.  
   g. Thrust restraints shall be installed on all cabinet fan heads, axial or centrifugal fans whose thrust exceeds 10% of unit weight.  
   h. Housekeeping pads for equipment in this section must be properly doweled or bolted, using wedge type expansion bolts to meet the acceleration criteria. Anchor equipment or isolators to housekeeping pads.

C. PIPING ISOLATION  
1. Installation:
a. General
   1) Hanger isolators shall be installed with the hanger box hung as close as possible to the structure. (Without touching)
   2) Hanger rods shall not short-circuit the hanger box.
b. All piping in mechanical equipment room(s) attached to rotating or reciprocating equipment shall be isolated as follows:
   1) Water and steam piping.
      a) Water pipe larger than 2” shall be hung with TYPE F isolators with 0.75” deflection.
      b) Horizontal floor or roof mounted water piping 1-1/4” to 2” and all steam piping larger than 1” shall be supported by TYPE P isolators with 0.3” deflection.
      c) Water pipe larger than 2” shall be supported by TYPE B isolators with 0.75” deflection.
c. Vertical riser supports for water & steam pipe 4” diameter and larger shall be isolated from the structure using TYPE K guides and anchors.
d. Install TYPE FC-1 flexible connectors at all connections of pipe to externally isolated equipment.
e. Install FC-2 or 4 type connectors only at locations which exceed temperature limitations of FC-1 or service requires stainless steel or bronze construction flex. (Such as; spaces without floor drains, or pipes carrying gas, fuel oil, steam or Freon)

D. SEISMIC RESTRAINTS
   1. Installation
a. All floor mounted equipment whether isolated or not shall be snubbed, anchored, bolted or welded to the structure. Calculations that determine that isolated equipment movement may be less than the operating clearance of snubbers (restraints) do not preclude the need for snubbers. All equipment must be positively attached to the structure.
b. All suspended equipment including, but not limited to; air handling units, pumps, fans, tanks, stacks, VAV boxes, unit heaters, fan powered boxes, cabinet unit heaters, etc. shall be two or four point independently braced with TYPE III restraints. Install cable braces taught for non-isolated equipment and slack with ½” cable deflection for isolated equipment. VAV Boxes (without fans) attached directly to ductwork on the main supply side shall be considered as ductwork for seismic design purposes. Rod bracing shall be installed as per approved submittals and shop drawings. Equipment rigidly connected to ductwork weighing less than 75 lbs. is excluded.
c. All horizontally suspended pipe and duct shall use RESTRAINT TYPE III. Spacing of seismic bracing shall be as per TABLE B at the end of this section.
d. For all trapeze-supported piping, the individual pipes must be attached to the trapeze support at the designated restraint locations.
e. For overhead supported equipment, over stress of the building structure must not occur. Bracing may occur from:
   1) Flanges of structural beams.
   2) Upper truss chords in bar joists.
   3) Cast in place inserts or drilled and shielded inserts in concrete structures.
f. Pipe Risers
   1) Where pipe pass through cored holes, holes must be packed with resilient material or fire stop as specified in other sections of this specification and/or state and local codes. No additional horizontal seismic bracing is required at these locations.
   2) Non-isolated, constant temperature pipe risers through cored holes require a riser clamp at each floor level on top of the slab attached in a seismically approved manner for vertical restraint.
3) Non-isolated, constant temperature pipe risers in pipe shafts require structural steel attached in a seismically approved manner at each floor level and a riser clamp at each floor level on top of, and fastened to the structural steel. The riser clamp and structural steel must be capable of withstanding all thermal, static and seismic loads.

4) Isolated and/or variable temperature risers through cored holes require Type K riser resilient Guides and Anchors installed to meet both thermal expansion and seismic acceleration criteria.

5) Isolated and/or variable temperature risers in pipe shafts require Type K resilient riser guides and anchors installed on structural steel to meet both thermal expansion and seismic acceleration criteria. Each floor level must have a riser clamp that does not interfere with the thermal expansion/contraction of the pipe.

g. All non-isolated floor or wall mounted equipment and tanks shall use RESTRAINT TYPE III or V.

h. Where base anchoring of equipment is insufficient to resist seismic forces, restraint TYPE III shall be located above the unit’s center of gravity to suitably resist “G” forces specified.

1) Vertically mounted tanks and up-blast tubular centrifugal fans, tanks or similar equipment may require this additional restraint.

i. A rigid piping or duct system shall not be braced to dissimilar parts of a building or two dissimilar building systems that may respond in a different mode during an earthquake. Examples: Wall and roof; solid concrete wall and a metal deck with lightweight concrete fill, pipes & duct that cross a building expansion joint.

2. Exclusions from seismic requirements on non life safety equipment:

a. Piping exemptions

1) All piping less than 2-1/2" diameter except in mechanical rooms where piping less than 1-1/4" is exempted.

2) All clevis or single level trapeze supported piping suspended by hangers with positive attachment to the structure that are less than 12 inches in length as measured from the top of the pipe to the point of attachment to the structure. If any hanger in the run exceeds the 12” limit, seismic bracing is required for the run.

E. INSPECTION

1. If in the opinion of the project engineer the seismic restraint installation does not meet with the project requirements, an outside consultant will be retained to inspect, verify and submit corrective measures to be taken. The consultant's fees and all work associated with such a review shall be borne by the contractor.
**TABLE A**

**VIBRATION ISOLATION & SEISMIC RESTRAINT REQUIREMENTS FOR HVAC EQUIPMENT**

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>SIZE (5) (8)</th>
<th>MOUNTING</th>
<th>ISO L</th>
<th>DEF L</th>
<th>BASE</th>
<th>ISO L</th>
<th>DEF L</th>
<th>BASE</th>
<th>ISO L</th>
<th>DEF L</th>
<th>BASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHILLERS &amp; CONDENSING UNITS</td>
<td>ALL</td>
<td>FLOOR</td>
<td>G</td>
<td>0.1</td>
<td>--</td>
<td>B</td>
<td>0.75</td>
<td>--</td>
<td>--</td>
<td>1.5</td>
<td>B-4</td>
</tr>
<tr>
<td></td>
<td>To 5 TONS</td>
<td>FLOOR / ROOF</td>
<td>D</td>
<td>0.25</td>
<td>--</td>
<td>D</td>
<td>0.25</td>
<td>--</td>
<td>--</td>
<td>.75</td>
<td>B-6</td>
</tr>
<tr>
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<td>6-20 TONS</td>
<td></td>
<td>B</td>
<td>1.0</td>
<td>--</td>
<td>B</td>
<td>1.5</td>
<td>--</td>
<td>--</td>
<td>1.5</td>
<td>B-4</td>
</tr>
<tr>
<td></td>
<td>OVER 20 TONS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EXTERIOR PIPE SUPPORT SYSTEM</td>
<td>ALL</td>
<td>SLAB / ROOF</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>B-11</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**TABLE A NOTES:**

**GENERAL:** ISOL = Isolator, DEFL. = Deflection, All deflections indicated are in inches.

1. Units may not be capable of point support. Refer to separate equipment specification section, if base is not provided by that section and external isolation is required, provide Type B-1 base by this section for entire unit.
2. Static deflection shall be determined on the deflection guide. Deflections indicated are minimums at actual load and shall be selected from manufacturer’s nominal 4", 3", 2" and 1" deflection spring series. R.P.M. is defined as the slowest operating speed of the equipment.
3. Single stroke compressors may require inertia bases with thickness greater than 12" max. As described for base B-2. Inertia base mass shall be sufficient to maintain double amplitude of 1/8".
4. For floor mounted fans substitute base TYPE B-2 for class 2 or 3 or any class fan with static pressure over 5".
5. Equipment with less than 1/3 H.P. is excluded from vibration requirements. (Seismic requirements still apply)
6. Utility sets with wheel diameters less than 15" need not have deflections greater than 0.75".
7. Curb mounted fans with curb area less than nine (9) square feet are excluded.
8. For equipment with multiple motors, H.P. Classification applies to largest single motor.

**DEFLECTION GUIDE**

<table>
<thead>
<tr>
<th>R.P.M.</th>
<th>DEFLECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LESS THAN 400</td>
<td>3.50&quot;</td>
</tr>
<tr>
<td>401 TO 600</td>
<td>2.50&quot;</td>
</tr>
<tr>
<td>601 TO 900</td>
<td>1.50&quot;</td>
</tr>
<tr>
<td>OVER 900</td>
<td>0.75&quot;</td>
</tr>
</tbody>
</table>

**TABLE B**

**SEISMIC BRACING TABLE**

<table>
<thead>
<tr>
<th>EQUIPMENT</th>
<th>ON CENTER SPACING</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIPE</td>
<td>TRANSVERSE</td>
</tr>
<tr>
<td></td>
<td>40 Feet</td>
</tr>
</tbody>
</table>

**NOTE WELL**

Projects that contain large pipe may require that the allowable spacing shown in this Table be reduced to minimize structural loading. All associated costs shall be the responsibility of the contractor. Close coordination and approval by the structural engineer is mandatory for all seismic point loads exceeding 2,000 lbs.
3.10 INSTALLATION OF METERS AND GAUGES

A. Install one pressure gage per pump, with taps before strainers and on suction and discharge of pump; pipe to gage.

B. GENERAL
   1. Install gage taps in piping.
   2. Install pressure gages with pulsation dampers. Provide needle valve or ball valve to isolate each gage. Extend nipples and siphons to allow clearance from insulation.
   4. Install thermometers in air duct systems on flanges.
   5. Locate duct mounted thermometers minimum 10 feet downstream of mixing dampers, coils, or other devices causing air turbulence.
   6. Coil and conceal excess capillary on remote element instruments.
   7. Provide instruments with scale ranges selected according to service with largest appropriate scale.
   8. Install gages and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.
   9. Adjust gages and thermometers to final angle, clean windows and lenses, and calibrate to zero.

C. SCHEDULES
   1. Pressure Gages.
      a. Chillers.
         1) Location: Chilled Water Inlet and Outlet, Condenser Water Inlet and Outlet
         2) Scale range: 0 - 100 psi
   2. Stem Type Thermometers:
      a. Chilled water Headers to central equipment.
         1) Location: Inlet and Outlet
         2) Scale range: 0 - 100 F
      b. Chillers - Chilled Water Inlet and Outlet, Condenser Water Inlet and Outlet
         1) Location: Inlet and Outlet
         2) Scale range: 0 - 100 F
   3. Test Plug Location:
      b. Chiller - inlets and outlets.

3.11 INSTALLATION OF PIPING SPECIALTIES

A. PIPE ESCUTCHEONS: Install on each pipe penetration through floors, walls partitions and ceilings where penetration is exposed to view.

B. Y-TYPE STRAINERS: Install full size of pipe line, install pipe nipple and blow-down valve except for strainers 2" and smaller ahead of control valves feeding individual terminals.

C. DIELECTRIC UNIONS: Install at each piping joint between ferrous and non-ferrous piping.
D. **MECHANICAL SLEEVE SEALS:** Loosely assemble rubber links around pipe with bolts and pressure plates located under each bolt head and nut. Push into sleeve and center. Tighten bolts until links have expanded to form watertight seal.
   1. Install at all exterior concrete wall and slab-on-grade service piping penetrations into building.

E. **FIRE BARRIER PENETRATION SEALS:** Fill entire opening with sealing compound.

F. **PIPE SLEEVES:** Install of type indicated where piping passes through walls, floors, ceilings, and roofs. Install sleeves accurately centered on pipe runs. Size sleeves so that piping and insulation (if any) will have free movement. Install length of sleeve equal to thickness of construction penetrated, and finish flush to surface; except for floor sleeves. Extend floor sleeves 1/4" above level finish floor or as indicated.
   1. Install sheetmetal sleeves at interior partitions and ceilings other than suspended ceilings.
   2. Install steel pipe iron pipe sleeves at exterior penetrations; both above and below grade.
   3. Install steel or plastic sleeves except as otherwise indicated.

G. **SLEEVES SEALS**
   1. Fill and pack annular space between sleeve and pipe with approved fire caulk on both sides.

3.12 **INSTALLATION OF VALVES**

A. Locate valves so as to be accessible and so that separate support can be provided when necessary.

B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with hose-end adapter for each valve that must be installed with stem below horizontal plane.

C. Where insulation is indicated, install extended stem valves, arranged to receive insulation.

D. **Mechanical Actuators:** Install mechanical actuators with chain operators where indicated. Extend chains to about 5’ above floor and hook to clips to clear aisle passage.

E. Install swing check valves in horizontal position with hinge pin horizontally perpendicular to center line of pipe.

F. Install wafer check valves between 2 flanges in horizontal or vertical position.

G. Install lift check valves in piping line with stem vertically upward.

H. **Valve Adjustment:** After piping systems have been tested and put into service, but before final testing, adjusting, and balancing, inspect each valve for possible leaks, replace valve if leak persists.

I. **Cleaning:** Clean factory finished surfaces. Repair any marred or scratched surfaces with manufacturer's touch-up paint.

3.13 **INSTALLATION OF HANGERS AND SUPPORTS**

A. **INSERTS**
1. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
2. Where concrete forms finished ceiling, provide inserts to be flush with slab surface.
3. Where inserts are omitted, drill through from below and provide through bolts with recessed steel plate and nut flush with slab.

B. PIPE HANGERS AND SUPPORTS
1. Support horizontal piping as follows:
   a. PIPE SIZE  MAX. SPACING  ROD DIA.
   b. 2 to 1-1/4"  6'-6"  3/8"
   c. 1-1/2 to 2"  10'-0"  3/8"
   d. 2-1/2 to 3"  10'-0"  2"
   e. 4 to 6"  10'-0"  5/8"
   f. 8 to 12"  14'-0"  7/8"
   g. 14 & over  20'-0"  1"
2. Install hangers to provide minimum 2 inch space between finished covering and adjacent work.
3. Place hanger within 12 inches of each horizontal elbow.
4. Support vertical piping at every floor.
5. Where several pipes can be installed in parallel and at same elevation, provide trapeze or multiple hangers.

3.14 INSTALLATION OF MECHANICAL IDENTIFICATION

A. PREPARATION
1. Degrease and clean surfaces to receive adhesive for identification materials.

B. INSTALLATION
1. Plastic Nameplates: Install with corrosive resistant mechanical fasteners, or adhesive.
2. Metal Tags: Install with corrosive resistant chains.
3. Plastic Pipe Markers: Install in accordance with manufacturer's instructions.
4. Plastic Tape Duct Markers: Install in accordance with manufacturer's instructions.
5. Underground Plastic Pipe Markers: Install 6 to 8 inches below finished grade, directly above buried pipe.

C. APPLICATION
1. EQUIPMENT NAMEPLATES: Install and permanently fasten equipment nameplates on each major item of mechanical equipment that does not have nameplate or has nameplate that is damaged or located where not easily visible. Locate nameplates where accessible and visible. Include nameplates for the following general categories of equipment:
   a. Pumps, compressors, chillers, condensers, and similar motor-driven units.
   b. Control components
2. EQUIPMENT MARKERS: Install equipment markers with permanent adhesive on or near each major item of mechanical equipment. Data required for markers may be included on signs, and markers may be omitted if both are indicated.
   a. Letter Size: Minimum 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   b. Distinguish among multiple units, indicate operational requirements, indicate safety and emergency precautions, warn of hazards and improper operations, and identify units.
   c. Include markers for the following general categories of equipment:
      1) Meters, gages, thermometers, and similar units.
2) Pumps, compressors, chillers, condensers, and similar motor-driven units.

3. EQUIPMENT SIGNS: Install equipment signs with screws or permanent adhesive on or near each major item of mechanical equipment. Locate signs where accessible and visible.
   a. Identify mechanical equipment with equipment markers in the following color codes:
   b. Green: For cooling equipment and components.
   c. Yellow: For heating equipment and components.
   d. Green and Yellow: For combination cooling and heating equipment and components.
   e. Brown: For energy-reclamation equipment and components.
   f. Letter Size: Minimum 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
   g. Distinguish among multiple units, indicate operational requirements, indicate safety and emergency precautions, warn of hazards and improper operations, and identify units.
   h. Include signs for the following general categories of equipment:
      1) Pumps, compressors, chillers, condensers, and similar motor-driven units.
      2) Tanks and pressure vessels.
      3) Strainers, filters, humidifiers, water-treatment systems, and similar equipment.
      4) Control Components

4. WARNING-TAG INSTALLATION: Print required message on, and attach warning tags to, equipment and other items where required.

5. ACCESS PANELS: Identify all access doors and panels.

6. VALVES: Identify valves, except valves within heating or cooling terminals, with metal tags.

7. VALVE CHART AND SCHEDULE: Provide valve chart and schedule in aluminum frame with clear plastic shield. Install at location as directed.

8. CONCEALED EQUIPMENT LOCATION INDICATORS: Provide markings for all concealed equipment and systems requiring routine maintenance to indicate location of access. Equipment to be indicated includes but is not limited to terminal boxes, terminal equipment, reheat coils, filters, control dampers, etc. Coordinate marking system methods and products with Owner and Architect.

D. Locate Piping identification and flow arrows as follows:
   1. Identify piping, concealed or exposed, with plastic pipe markers. Identify service and flow direction. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and "T", at each side of penetration of structure or enclosure, and at each obstruction.
   2. On vertical pipes approximately seven feet above floor.
   3. Behind each access door and panel.
   4. At each change of direction of piping.
   5. On each piping branch close to point of connection to main piping.
   6. At valves.
   7. At no greater than intervals of 50 feet on straight runs of piping, and on both sides of walls.

E. Do color coding of pipes with two (2) inch wide bands according to color schedule to be issued by the Owner during the progress of the work.

F. Labeling on all exposed piping in finished spaces shall be on top of the piping out of line of sight.
G. Identify all pumps, controls, remote switches, starters, disconnects, pushbuttons and similar equipment as to service with white lamacoid engraved name-plates with black letters. Firmly secure with self-tapping screws. Submit sample plates and lettering for review.

H. Install valve tags at each valve. Attach to valves with four (4) inch brass chains.

### 3.15 INSTALLATION OF PIPE INSULATION

**A. GENERAL**

1. Install materials after piping has been tested and approved.
2. Install materials in accordance with manufacturer's instructions.
3. Continue insulation with vapor barrier through penetrations.
4. On insulated piping systems with vapor barrier, insulate fittings, valves, unions, flanges, strainers, PT plugs, drains, flexible connections and expansion joints. All cold piping surfaces shall be insulated. Balancing valves and PT plugs shall have insulation which is removable and reattachable.
5. On insulated piping systems without vapor barriers and piping conveying fluids 140 deg. F. or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation at such locations.
6. Provide an insert, not less than 6 inches long, of same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2 inch diameter and larger, to prevent insulation from sagging at support points. Inserts shall be cork or other heavy density insulating material suitable for the planned temperature range. Factory fabricated inserts may be used.
7. Neatly finish insulation at supports, protrusions, and interruptions.
8. Exterior Applications: Provide indicated jacket with seams located on the bottom of horizontal piping. Insulate fitting, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement.
9. INSULATION OMITTED: Omit insulation on hot piping within radiation enclosures or unit cabinets; on cold piping within unit cabinets providing piping is located over drain pan; on condensate piping between steam trap and union; and on unions, flanges, strainers, flexible connections, and expansion joints.

**B. PIPE INSULATION APPLICATION**

1. Insulate the following piping systems with the type and thickness of insulation indicated as follows:
   - 1) F.G. = FIBERGLASS

<table>
<thead>
<tr>
<th>PIPING SYSTEM</th>
<th>INSUL TYPE</th>
<th>PIPE SIZE</th>
<th>&lt; 1&quot;</th>
<th>1&quot; to &lt; 1.5&quot;</th>
<th>1.5&quot; to &lt; 4&quot;</th>
<th>4&quot; to 8&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>CH WATER SUP/RET</td>
<td>F.G</td>
<td>0.5</td>
<td>0.5</td>
<td>1.0</td>
<td>1.0</td>
<td></td>
</tr>
</tbody>
</table>

2. Contractor is responsible to meet thickness of insulation listed or local code requirement as a minimum. The more stringent requirement shall take precedence.

**C. INDOOR, PIPE INSULATION JACKET APPLICATION**

1. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket. On vapor-barrier piping systems, continue the vapor barrier under all fitting covers.
2. Piping, Concealed:
   a. None.
3. Piping, Exposed:
   a. PVC, Color-Coded by System.
D. OUTDOOR, PIPE INSULATION APPLICATION
1. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket. On vapor-barrier piping systems, continue the vapor barrier under all fitting covers.
2. Piping, Exposed:
   a. Aluminum

3.16 INSTALLATION OF EQUIPMENT INSULATION
A. GENERAL
1. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; and free of voids throughout the length of equipment.
2. Do not insulate factory insulated equipment.
3. Apply insulation as close as possible to equipment by grooving, scoring, beveling insulation, if necessary. Secure insulation to equipment with studs, pins, clips, adhesive, wires, or bands.
4. Fill joints, cracks, seams, and depressions with bedding compound to form smooth surface. On cold equipment, use vapor barrier cement.
5. Cover Rigid Fiberglass and Calcium Silicate insulation with metal mesh finish and finish with heavy coat of insulating cement.
6. Do not insulate over nameplates or testing agency labels and stamps. Bevel and seal insulation around such.
7. When equipment with insulation requires periodical opening for maintenance, repair, or cleaning, install insulation in such a manner that it can be easily removed and replaced without damage.
8. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either the wet or dry state.
9. Apply multiple layers of insulation with longitudinal and end seams staggered.
10. Keep insulation materials dry during application and finishing.
11. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.
12. Apply insulation with the least number of joints practical.
13. Apply insulation over fittings and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
14. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic. Apply insulation continuously through hangers and around anchor attachments.
15. Insulation Terminations: For insulation application where vapor retarders are indicated, seal ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.
16. Cut insulation according to manufacturer's written instructions to prevent compressing insulation to less than 75 percent of its nominal thickness.
17. Install vapor-retarder mastic on equipment scheduled to receive vapor retarders. Overlap insulation facing at seams and seal with vapor-retarder mastic and pressure-sensitive tape having same facing as insulation. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-retarder seal.

B. APPLICATION
1. Insulate the following equipment:
2. Insulate heat exchangers with 2" thick Rigid Fiberglass equipment insulation.
3. Insulate chilled water pump bodies with 1" thick Rubber Sheet equipment insulation.
C. Omit insulation from the following:
1. Vibration-control devices.
2. Testing agency labels and stamps.
3. Nameplates and data plates.
5. Handholes.
6. Cleanouts.

3.17 INSTALLATION OF HYDRONIC PIPING SYSTEMS

A. GENERAL: Unless otherwise indicated install hydronic piping as follows:
1. Install eccentric reducers where pipe is reduced in size in direction of flow, with tops of both pipes and reducer flush.
2. Install piping at a uniform grade of 0.2 percent upward in direction of flow.
3. Unless otherwise indicated, install branch connections to mains using tee fittings in main pipe, with the takeoff coming out the bottom of the main pipe. For up-feed risers, install the takeoff coming out the top of the main pipe.
4. Install drains, consisting of a tee fitting, NPS ¾ ball valve, and short NPS 3/4threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.
5. Reduce pipe sizes using eccentric reducer fitting installed with level side up.
7. Install manual air vents at the system high points to allow bleeding off air.

B. VALVES: Unless otherwise indicated install valves as listed below and elsewhere as indicated.
1. Isolation: ball and butterfly valves.
2. Throttling:  ball and butterfly valves
3. Combination balancing and shut-off:  Refer to “HYDRONIC SPECIALTIES” elsewhere in these specifications.
4. Provide isolation valves at each hydronic terminal, coil and equipment and elsewhere as indicated.
5. Provide combination balancing and shut-off valves at each hydronic terminal, coil and equipment and elsewhere as indicated.
6. Provide balance cock at the by-pass port of each 3-way control.
7. Provide drain valves on each mechanical equipment item located to completely drain equipment; at base of each isolated riser and elsewhere as indicated or required to completely drain hydronic piping system.

C. EQUIPMENT CONNECTIONS:
1. Connect hydronic terminal, coil and equipment to the hydronic piping system in accordance to equipment manufacturer's instructions. Installation shall allow easy repair, cleaning, removal and replacement of hydronic terminal, coil and equipment.
2. Size for supply and return piping connections shall be same as for equipment connections.
3. Install control valves in accessible locations close to connected equipment.
4. For control valve 1 1/4” and greater install bypass piping with globe valve around control valve. If multiple, parallel control valves are installed, only one bypass is required.
5. Install ports for pressure and temperature gages at terminal, coil and equipment inlet and outlet connections.

D. CHEMICAL TREATMENT:
1. After cleaning and flushing, refill hydronic piping system, adding caustic soda to maintain pH of 8.0 to 8.5 and sodium sulfate in amount of 1/3 caustic soda or to maintain residual of 30 to 40 PPM in system. Add trisodium phosphate to make hardness of 0 PPM and residual of approximately 30 PPM in system. Repeat measurements daily with system under full circulation and apply chemicals to adjust levels until no apparent change is apparent.

3.18 INSTALLATION OF HYDRONIC SPECIALTIES

A. Install specialties in accordance with manufacturer's instructions.

B. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

C. Install only automatic air vents in mechanical equipment rooms only. Install at high points of system piping, at heat-transfer equipment and coils, and elsewhere as required for system air venting. Provide vent tubing to nearest drain. Where large air quantities can accumulate, provide enlarged air collection standpipes.

D. Install diaphragm-type compression tanks on floor. Vent and purge air from hydronic system, and ensure tank is properly charged with air to suit system design requirements.

E. Provide valved drain and hose connection on strainer blow down connection.

F. Remove temporary strainers after cleaning systems.

G. Support pump fittings with floor mounted pipe and flange supports.

H. Select system relief valve capacity so that it is greater than make-up pressure reducing valve capacity. Select equipment relief valve capacity to exceed rating of connected equipment.

I. Pipe relief valve outlet to nearest floor drain.

J. Where one line vents several relief valves, make cross sectional area equal to sum of individual vent areas.

3.19 WATER TREATMENT INITIALIZATION

A. PREPARATION

1. Systems shall be operational, filled, started, and vented prior to cleaning. Use water meter to record capacity in each system.
2. Place terminal control valves in open position during cleaning.
3. Verify that electric power is available and of the correct characteristics.

B. CLEANING SEQUENCE

1. Concentration:
   a. As recommended by manufacturer.
   b. One pound per 100 gallons of water contained in the system.
   c. One pound per 100 gallons of water for hot systems and one pound per 50 gallons of water for cold systems.
2. Chilled Water Systems:
   a. Circulate for 48 hours, then drain systems as quickly as possible.
   b. Refill with clean water, circulate for 24 hours, then drain.
3. Refill with clean water and repeat until system cleaner is removed.
4. Use neutralizer agents on recommendation of system cleaner supplier and approval of Architect/Engineer.
5. Flush open systems with clean water for one hour minimum. Drain completely and refill.
6. Remove, clean, and replace strainer screens.
7. Inspect, remove sludge, and flush low points with clean water after cleaning process is completed. Include disassembly of components as required.

C. INSTALLATION
1. Install in accordance with manufacturer's instructions.

D. CLOSED SYSTEM TREATMENT
1. Introduce closed system treatment through bypass feeder when required or indicated by test.
2. Provide 3/4 inch water coupon rack around circulating pumps with space for 12 test specimens.

E. Extra Materials: Furnish sufficient chemicals for initial system start-up and for preventative maintenance for one year from date of substantial completion.

F. Manufacturer's Field Services
1. Prepare, calibrate and start systems.
2. Start-up system in presence of and instruct Owners operating personnel.
3. Provide monthly maintenance checks of the system and correct any deficiencies discovered during checks. Checks shall occur from the commencement of the warranty until the warranty period has expired. The base warranty period shall be one year. As an alternate scope of work provide an additional one year warranty period for a total of two years.
4. Retest System at the completion of 1 year period. Submit test report. Refer to Part 1, Standard Reporting Requirements.

3.20 INSTALLATION OF CHILLERS
A. Install in accordance with manufacturer's instructions.
B. Provide for connection to electrical service. Refer to DIVISION 26 – ELECTRICAL.
C. Provide for connection of electrical wiring between starter and chiller control panel, oil pump, and purge unit. Refer to DIVISION 26 – ELECTRICAL.
D. Align chiller on concrete foundations, sole plates, and sub-bases. Level, grout, and bolt in place.
E. Install units on vibration isolation. Refer to VIBRATION ISOLATION AND SEISMIC RESTRAINT paragraph of these specifications.
F. Provide evaporator connections to chilled water piping.
1. On inlet, provide:
   a. Thermometer well for temperature controller.
   b. Thermometer well and thermometer.
   c. Strainer.
   d. Nipple and flow switch.
   e. Flexible pipe connector.
   f. Pressure gage.
g. Shut-off valve.

2. On outlet, provide:
   a. Thermometer well and thermometer.
   b. Flexible pipe connector.
   c. Pressure gage.
   d. Shut-off and Balancing valve.

G. Furnish and install necessary auxiliary water piping for oil cooling units and purge condensers.

H. Insulate evaporator and cold surfaces.

I. Provide condenser connection to condenser water piping.
   1. On inlet, provide:
      a. Thermometer well for temperature controller.
      b. Thermometer well and thermometer.
      c. Strainer.
      d. Nipple and flow switch.
      e. Flexible pipe connector.
      f. Pressure gage.
      g. Shut-off valve.
   2. On outlet, provide:
      a. Thermometer well and thermometer.
      b. Flexible pipe connector.
      c. Pressure gage.
      d. Shut-off and Balancing valve.

J. Arrange piping for easy dismantling to permit tube cleaning.

K. Provide piping from chiller rupture disc to outdoors. Size as recommended by manufacturer.

L. Manufacturer's Field Services
   1. Prepare and start systems.
   2. Provide services of factory trained representative for minimum one day to leak test, refrigerant pressure test, evacuate, dehydrate, charge, start-up, calibrate controls, and instruct Owner on operation and maintenance.
   3. Supply initial charge of refrigerant and oil.

3.21 TESTING, ADJUSTING AND BALANCING

A. ACCEPTABLE BALANCERS
   1. Outside a 75 mile radius of Boston, provide the services of an independent AABC or NEBB certified air balancing contractor. Submit contractor qualifications for approval prior to commencement of testing, adjusting, and balancing.

B. EXAMINATION
   1. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
      a. Systems are started and operating in a safe and normal condition.
      b. Temperature control systems are installed complete and operable.
      c. Proper thermal overload protection is in place for electrical equipment.
      d. Hydronic systems are flushed, filled, and vented.
      e. Pumps are rotating correctly.
f. Proper strainer baskets are clean and in place. Strainers shall have been blown down by HVAC.
g. Service and balance valves are open.

2. Submit field reports. Report defects and deficiencies noted during performance of services which prevent system balance. Refer to Part 1, Standard Reporting Requirements.

C. Beginning of work means acceptance of existing conditions.

D. PREPARATION
1. Coordinate two balancing meetings as follows:
   a. For renovation projects, at the first construction kick off meeting, coordinate a preconstruction balancing meeting which will ensure the provision of preconstruction balancing per paragraph H, "Renovation Pre-construction Testing," of this section.
   b. Following a construction meeting, prior to post-construction balancing work associated with to this section, when the commissioning agent and engineer are scheduled for attendance, provide a post-construction balancing meeting. Provide anticipated balancing report format, and troubleshoot in advance any obstacles that could prevent the balancing process from being completed as required.
2. Provide instruments required for testing, adjusting, and balancing operations. Make instruments available to Architect/Engineer to facilitate spot checks during testing.
3. Provide additional balancing devices as required.

E. INSTALLATION TOLERANCES
1. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

F. ADJUSTING
1. Ensure recorded data represents actual measured or observed conditions.
2. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
3. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
4. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
5. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.
6. Check and adjust systems approximately six months after final acceptance and submit report. Refer to Part 1, Standard Reporting Requirements.

G. PHASED CONSTRUCTION
1. Where project is intended to be constructed in multiple phases perform testing, balancing and submit balancing reports at the completion of each phase.
2. At the completion of the project submit a complete balancing report of all phases.
3. Test and adjust systems making provisions for .Measure and prepare a balancing report prior to demolition and/or new construction.
4. Make provisions for temporary balancing or reduce flows as required.

H. WATER SYSTEM PROCEDURE
2. Adjust water systems to provide required or design quantities.
3. Use calibrated Venturi tubes, orifices, or other metered fittings and pressure gauges to determine flow rates for system balance. Where flow metering devices are not installed, base flow balance on temperature difference across various heat transfer elements in the system.
4. Adjust systems to provide specified pressure drops and flows through heat transfer elements prior to thermal testing. Perform balancing by measurement of temperature differential in conjunction with air balancing.

5. Effect system balance with automatic control valves fully open to heat transfer elements.

6. Effect adjustment of water distribution systems by means of balancing cocks, valves, and fittings. Do not use service or shut-off valves for balancing unless indexed for balance point.

7. Where available pump capacity is less than total flow requirements or individual system parts, full flow in one part may be simulated by temporary restriction of flow to other parts.

I. SCHEDULES

1. Equipment requiring sound level, Air, Water, and vibration - testing, Adjusting, and Balancing:
   a. HVAC Pumps
   b. Water Chillers

2. Sound levels shall be taken at all motor driven equipment greater than 3/4 motor horsepower. Test sound levels at the equipment and in spaces above, below and/or adjacent to the equipment.

J. REPORT FORMS: Refer to Part 1, Standard Reporting Requirements. Provide sound level, water, air, and vibration - testing, balancing and adjustment. Submit reports in the following format:

1. Title Page:
   a. Name of Testing, Adjusting, and Balancing Agency
   b. Address of Testing, Adjusting, and Balancing Agency
   c. Telephone number of Testing, Adjusting, and Balancing Agency
   d. Project name
   e. Project location
   f. Project Architect
   g. Project Engineer
   h. Project Contractor
   i. Project altitude
   j. Report date

2. Summary Comments:
   a. Design versus final performance
   b. Notable characteristics of system
   c. Description of systems operation sequence
   d. Summary of outdoor and exhaust flows to indicate amount of building pressurization
   e. Nomenclature used throughout report
   f. Test conditions

3. Instrument List:
   a. Instrument
   b. Manufacturer
   c. Model number
   d. Serial number
   e. Range
   f. Calibration date

4. Electric Motors:
   a. Manufacturer
   b. Model/Frame
   c. HP/BHP
   d. Phase, voltage, amperage; nameplate, actual, no load
   e. RPM
   f. Service factor
   g. Starter size, rating, heater elements
5. Pump Data:
   a. Identification/number
   b. Manufacturer
   c. Size/model
   d. Impeller
   e. Service
   f. Indication of strainer blow-down by HVAC prior to work
   g. Design flow rate, pressure drop, BHP
   h. Actual flow rate, pressure drop, BHP
   i. Discharge pressure
   j. Suction pressure
   k. Total operating head pressure
   l. Shut off, discharge and suction pressures
   m. Shut off, total head pressure

6. Chillers:
   a. Identification/number
   b. Manufacturer
   c. Capacity
   d. Model number
   e. Serial number
   f. Indication of strainer blow-down by HVAC prior to work
   g. Evaporator entering water temperature, design and actual
   h. Evaporator leaving water temperature, design and actual
   i. Evaporator pressure drop, design and actual
   j. Evaporator water flow rate, design and actual
   k. Condenser entering water temperature, design and actual
   l. Condenser pressure drop, design and actual
   m. Condenser water flow rate, design and actual

7. Flow Measuring Station:
   a. Identification/number
   b. Location
   c. Size
   d. Manufacturer
   e. Model number
   f. Serial number
   g. Indication of strainer blow-down by HVAC prior to work
   h. Design Flow rate
   i. Design pressure drop
   j. Actual/final pressure drop
   k. Actual/final flow rate
   l. Station calibrated setting

8. Sound Level Report:
   a. Location
   b. Octave bands - equipment off
   c. Octave bands - equipment on

3.22 SELECTIVE DEMOLITION

A. The extent of the demolition work is shown on the drawings or described in this specification.

B. Refer to DIVISION 1 Sections "CUTTING AND PATCHING" and "SELECTIVE DEMOLITION" for general demolition requirements and procedures.
C. Disconnect, demolish, and remove mechanical systems, equipment, and components indicated to be removed.
   1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
   2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
   3. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   4. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   5. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
   6. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

D. RELATED WORK
   1. GENERAL CONTRACTOR
      a. Cuts wall and surfaces to provide access to elements to be removed or disconnected.
   2. ELECTRICAL CONTRACTOR
      a. Disconnects live wiring to all equipment or systems to be removed.
   3. PLUMBING CONTRACTOR
      a. Disconnects live plumbing and domestic water to all equipment to be removed.

E. CODES, ORDINANCES AND REGULATORY REQUIREMENTS
   1. Comply with all state and local codes as to removal and disposal of equipment removed from the site.
   2. Comply with governing EPA notification regulations before beginning selective demolition.
   3. Comply with hauling and disposal regulations of authorities having jurisdiction.

F. PERMITS
   1. Give all required notices, file all required plans and Specifications relating to the work of this Section with the proper authorities and pay for any required permits.

G. SITE EXAMINATION
   1. Visit site prior to submitting bid to become familiar with the existing conditions which may affect the removal of systems or products provided as part of the work of this Section.
   2. Extra payment or compensation for work required by this Section due to existing conditions that would have been observed during the site examination will not be made.

H. REFRIGERANT RECOVERY
   1. All Air-conditioning equipment and systems shall be removed demolished without releasing refrigerants.
   2. Refrigerant recovery is to be performed by a Refrigerant Recovery Technician Certified by an EPA-approved certification program.

I. REMOVAL AND DISPOSAL
   1. All equipment and systems to be removed or demolished under this Section shall become the property of the contractor. The contractor shall remove all such equipment from the site promptly after detachment from building structure.
   2. Storage or sale of removed items or materials on-site is not permitted.
J. COORDINATION
1. Coordinate the work of this Section with all other project contractors.
2. Provide any special information or requirements needed for the proper and safe removal of equipment.

K. HAZARDOUS MATERIALS
1. It is unknown whether hazardous materials will be encountered in the Work.
2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.

L. UTILITY SERVICE
1. Maintain existing Mechanical/Electrical utilities/services indicated to remain in service and protect them against damage during selective demolition operations.
2. Maintain fire-protection facilities in service during selective demolition operations.
3. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

M. EXISTING WARRANTIES
1. Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

3.23 TRIAL USAGE
A. The owner shall be permitted trial usage of systems or parts of systems for the purpose of testing and learning operational procedures.
B. Trial usage shall not be construed as acceptance.
C. Trial usage shall be carried out with the express knowledge and under supervision of the HVAC Subcontractor, who shall not waive any responsibility because of trial usage.

3.24 INSTRUCTIONS TO OWNER
A. Submit to the Owner, lists for each system or piece of equipment indicating that all components have been checked and are complete prior to the instruction period.
B. Thoroughly instruct the Owner’s authorized representative in the safe operation of the systems and equipment. This instructional procedure shall be videotaped by this contractor and three copies of the tape submitted to the Architect.
C. Arrange and pay for the services of qualified manufacturer’s representatives to instruct Owner on specialized portions of the installation. This shall include 8 hours in the operation of packaged equipment, 16 hours of operation of the automatic temperature control system. Instruction shall take place on-site at time agreed to by Owner.
D. Submit a complete record of instructions given to the Owner. For each instruction period, supply the following data:
1. Date.
2. Duration.
3. System or equipment involved.
4. Names of persons giving instructions.
5. Other people present.

END OF SECTION 23 00 00