PROJECT MANUAL

RFP/LOI #B2019008
CHILLER PLANT UPGRADES

Frank J. Licht Judicial Complex
250 Benefit Street
Providence, Rhode Island

STATE OF RHODE ISLAND

RHODE ISLAND JUDICIARY

May 31, 2019

EDWARD ROWSE ARCHITECTS, INC.
400 MASSASOIT AVENUE
SUITE 300, SECOND FLOOR
EAST PROVIDENCE, RI 02914
(401) 331-9200

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

JUDICIAL PURCHASING OFFICE
670 NEW LONDON AVENUE
CRANSTON, RHODE ISLAND 02920
TEL: 401-275-6527 FAX: 401-275-6530

BID SOLICITATION INFORMATION

DATE: 9/13/2019 **RFP/LOI#:** B2019008	**Pre-Bid/Proposal Conference:** Yes
Project Name: Chiller Plant Upgrades – Licht Judicial Complex	**Pre-Bid attendance mandatory:** Yes
Opening Time & Date: 10:00a.m. October 1, 2019	**Pre-Bid Time & Date:** 7:30a.m. September 24, 2019
Place: Purchasing Office, Rm 1006 670 New London Avenue Cranston, RI 02920	**Pre-Bid Location:** 1st Floor Lobby Licht Judicial Complex 250 Benefit Street Providence, RI 02903

The successful bidder will be required to furnish all insurance documentation as outlined in the attached Judicial Purchasing Rules & Regulations and General Terms & Conditions of Purchase which are available for inspection at http://www.courts.ri.gov/PublicResources/purchasingrules/PDFs/Purchasing-Rules-Reg.pdf.

This is a Request for Proposals ("RFP") for Chiller Plant Upgrades at the Licht Judicial Complex located at 250 Benefit Street, Providence, RI 02903. Specific bid solicitation information begins on page 3 of this document.

Proposals must be mailed or hand-delivered in a sealed envelope marked with the above RFP/LOI# and Project Name to:

Rhode Island Traffic Tribunal
Judicial Purchasing, Room 1006
670 New London Avenue, Cranston RI, 02920

The Administrative Office of State Courts (the "AOSC") reserves the right to award a contract pursuant to this RFP on the basis of cost alone, to accept or reject any or all bids, and to act in its best interest including, but not limited to, directly negotiating with any vendor who submits a proposal in response to this RFP and to award a contract based upon the results of those negotiations alone. Proposals found to be technically or substantially nonresponsive at any point in the evaluation process will be rejected and not considered further. The AOSC may, at its sole option, elect to require presentations(s) by bidders in consideration for an award.

Questions concerning this solicitation may be e-mailed to the Supreme Court Purchasing Office at purchasing@courts.ri.gov no later than September 26, 2019. Please reference the RFP / LOI number on all correspondence. Answers to questions received, if any, will be posted on the internet as an Addendum to this bid solicitation.

Carla Ciccone
Purchasing Agent
Rhode Island Supreme Court

BIDDING DOCUMENTS

Bidding documents are available to view and print at http://www.purchasing.ri.gov/bidding/ExternalBidListing.aspx and/or https://www.courts.ri.gov/PublicResources/purchasingrules/Pages/default.aspx.

Bidders are required to provide Bid Security in the form of a Bid Bond, or a certified check payable to the State of Rhode Island, in the amount of a sum not less than five percent (5%) of the Bid Price. Bid surety must be attached to the Bid Form. Performance, labor and payment bonds will be required at time of award.

Questions concerning this RFP must be e-mailed to the office of the Architect at trowse@rowsearch.com no later than September 26, 2019. Please reference the RFP/LOI number on all correspondence. Answers to questions received, if any, will be discussed at the pre-bid/proposal conference and included in the meeting summary, which will be posted on the internet at: http://www.purchasing.ri.gov/bidding/ExternalBidSearch.aspx and http://www.courts.ri.gov/ .

SECTION 00 01 17 – LIST OF DRAWINGS

GENERAL

The drawings for this project represent an integral part of the Contract Documents and they, along with the technical specifications, form a complete process of disseminating specific information required to perform the Work of this Project.

The following schedule indicates the Drawings of this Project, ordered for convenience only, and do not obligate the Contractor to perform the Work in any specific sequence, nor construed as specific Work for a specific trade, Subcontractor or supplier.

DRAWING NUMBER	TITLE
T1	Title Sheet
ARCHITECTURAL	
A1.00	Basement & Partial First Floor Key Plans
MECHANICAL	
M-200	Chiller Plant Flow Diagram
M-201	Mechanical Room Refrigerant Purge Control Diagram
M-300	Mechanical Room Demo / New Work Part Plans
M-800	Equipment Schedules
ELECTRICAL	
E-101	Electrical Notes, Legend, Abbreviations & Demo Floor Plans
E-102	Electrical Schedules, One-Line Diagram, & New Work Floor Plans

END OF SECTION 00 01 17

SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS

AIA Document A701, Instructions to Bidders - 1997 Edition is included, following this page, as an integral part of the Bidding Documents. Provisions not amended or supplemented remain in full force and effect.

END OF SECTION 00 21 13

AIA® Document A701™ – 1997

Instructions to Bidders

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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.

TABLE OF ARTICLES

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 COPIES

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

§ 3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

§ 3.3 SUBSTITUTIONS

§ 3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

§ 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS

§ 4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

§ 4.3.3 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the

signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 OPENING OF BIDS

At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

§ 5.2 REJECTION OF BIDS

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.3 ACCEPTANCE OF BID (AWARD)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

§ 6.2 OWNER'S FINANCIAL CAPABILITY

The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 SUBMITTALS

§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

.1 a designation of the Work to be performed with the Bidder's own forces;

.2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and

.3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1)

withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 BOND REQUIREMENTS

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

§ 7.2 TIME OF DELIVERY AND FORM OF BONDS

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

SECTION 00 22 13 – SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

The following supplements modify, change, delete from or add to "Instructions to Bidders," AIA Document A701, Fifth Edition, 1997. Where any Article is modified or any Paragraph or Subparagraph is modified or deleted, the unaltered provisions of that Article, Paragraph, or Subparagraph shall remain in effect.

1.1 Add the following:
The proposed Bidding Documents also include the Rhode Island Judicial Purchasing Rules and Regulations and General Terms and Conditions of Purchase along with any Judicial Purchasing Orders issued for the Project.

ARTICLE 3 BIDDING DOCUMENTS

3.1.1 Delete in its entirety and substitute the following:

3.1.1 Bidding documents are available to view and print at
http://www.purchasing.ri.gov/bidding/ExternalBidListing.aspx and/or
https://www.courts.ri.gov/PublicResources/purchasingrules/Pages/default.aspx.
The bidder shall be responsible for all costs associated with printing hard copies of bidding documents.

Bidders are required to provide Bid Security in the form of a Bid Bond, or a certified check payable to the State of Rhode Island, in the amount of a sum not less than five percent (5%) of the Bid Price. Bid surety must be attached to the Bid Form. Performance, labor and payment bonds will be required prior to the date of execution of the contract.

Other bidding requirements are set forth in the Instructions to Bidders section of the Bidding Documents.

3.1.2 Delete in its entirety without substitution.

3.2.4 Add the following:
A MANDATORY pre-bid conference will be held by the Owner.

Date, Time and Location:	Per Bid Solicitation Form, Section 00 11 16
Contact Person:	Stephen J. Kerr, Asst. State Court Administrator For Facilities, Operations and Security Licht Judicial Complex 250 Benefit Street Providence, RI 02903 401-222-4999 skerr@courts.ri.gov

ARTICLE 4 BIDDING PROCEDURES

Add the following sub-paragraphs to 4.3 Submission of Bids

4.3.5 Bids will be evaluated on the basis of the relative merits of the proposal, in addition to price. There will be no public opening and reading of responses received by the Owner pursuant to this request, other than to name those Bidders who have submitted proposals.

4.3.6 Potential Bidders are advised to review all sections of this Request carefully and to completely comply with all instructions as failure to provide a complete submission as described herein may result in rejection of the proposal as incomplete and nonresponsive.

4.3.7 All costs associated with developing or submitting a proposal in response to this Request, or to provide oral or written clarification of its content, shall be borne by the Bidder. The AOSC (Administrative Office of State Courts) assumes no responsibility for these costs.

4.3.8 All pricing submitted will be considered firm and fixed unless otherwise indicated herein.

4.3.9 Bids misdirected to other Judiciary locations or which are for whatever reason otherwise not received by the Judicial Purchasing Office by the time for opening, will be deemed late and will not be considered. The time clock in the Judicial Purchasing Office shall be the point of reference for purposes of this requirement.

4.3.10 It is intended that an award pursuant to this Request will be made to a prime contractor, who will assume responsisbility for all aspects of the Work. Joint venture and cooperative proposals will not be considered, but subcontracts are permitted, provided that their use is clearly indicated in the Bid, and the subcontractor(s) proposed are clearly identified therein.

ARTICLE 5 CONSIDERATION OF BIDS

Delete 5.1 in its entirety and substitute the following:

5.1 There will be no public opening and reading of the Bids received by the Judicial Purchasing Office Pursuant to this request. A list of the Bidders will be made available upon request.

Add the following Clause to 5.3.1:

5.3.1 Delete 5.3.1 in its entirety and substitute the following:

All submissions will be evaluated by a review committee. The contract shall be awarded on the basis of the highest evaluated Bid. Bids will be evaluated on a percentage basis as follows:

Ability to meet specifications	25%
Experience	40%
Price	35%
Total	100%

ARTICLE 6 POST-BID INFORMATION

6.2 Delete in its entirety without substitution.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

7.1.1 through 7.1.3 Delete in its entirety, and substitute the following:

7.1.1 The Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds must be secured through a surety company licensed to do business in the State of Rhode Island. Their costs shall be included in the Bid.

7.2.1 Delete in its entirety, and substitute the following:

7.2.1 The Bidder shall deliver the required bonds to the Owner prior to the date of execution of the Contract.

ADD ARTICLE 9 SPECIAL PROJECT BID INFORMATION AND CONDITIONS

9.1 Field Observations and Measurements

9.1.1 Bidders are solely responsible to conduct field observations and to take all field measurements of all conditions that may affect the Work to be performed.

9.1.1.1 Bidders shall survey all site conditions and shall thoroughly familiarize themselves with the Work to be peformed prior to submitting a Bid. Contractors will be responsible for providing all materials and labor, at no additional cost, when existing conditions or systems require modifications and the required modifications are in locations which were available for inspection prior to Bid or in locations which could reasonably have been inspected prior to bid.

9.1.2 Bidders shall be responsible for field measurement. The dimensions shown on Drawings provided by owner or Architect are to be used as a guide only and are not to be relied upon by Bidders for any purpose whatsoever including, but not limited to, estimates and/or final measurements.

9.2 BIDDER'S REPRESENTATIONS

9.2.1 By submitting a Bid, the Bidder warrants that it has inspected the site, has completely familiarized itself with all site conditions, has correlated this information with the requirements of the Bidding Documents, has full knowledge of the work required, and assumes full responsibility for the same.

9.2.2 By submitting a Bid, the Bidder and all proposed subcontractors warrant that they have carefully and thoroughly reviewed all Bidding Documents and have found them to be complete and free from errors, inconsistencies and/or ambiguities and are sufficient for the purpose intended. Bidder assumes full responsibility for any errors, inconsistencies and/or ambiguities in the Bidding Documents and agrees to hold harmless the Owner and Architect for any and all damages or injuries that may result from the same.

9.2.3 By submitting a Bid, the Bidder warrants that its employees, agents, and subcontractors are all adequately trained, skilled and experienced in the type of Work to be performed.

9.2.4 Neither the Bidder nor any of its employees, agents, suppliers or contractors have relied upon any verbal representations from the Owner, its employees or agents including architects, engineers or consultants, in assembling the Bid figure.

9.2.5 The Bid figure is based solely upon the Bidding Documents and properly issued written Addenda and not upon any other representations, written or oral.

9.2.6 After award of the Contract, no claim(s) for additional compensation resulting from any misunderstanding of the Bidding Documents, any errors, inconsistencies, or ambiguities in the Bidding Documents, or conditions at the site, will be entertained.

9.3 DUPLICATION OF ITEMS OF WORK

9.3.1 Where items of work have been duplicated in portions of the Drawings and Specifications, it will be assumed that the Bidders have specifically included the duplicated items in their Bid, unless the Owner has been notified, in writing, prior to submittal of Bids that duplication exists and the Owner issues instruction to establish limits of work and allocation of responsibility.

9.3.2 In the event that the Owner does not receive notification pertaining to duplication of items prior to Bidding and such duplications do occur after submittal of a Bid, the Owner shall then assign the duplicated items of Work to one of the parties and the Owner shall then be entitled to full credit for the items of work from the other party.

9.3.3 In the event that materials and/or equipment have been specified in the Bidding Documents with more than one standard of quality, it will be assumed that the Bidder concerned included

materials and or equipment with the higher quality standards in their Bid, unless the Owner agreed otherwise in writing.

9.4 ACCEPTANCE OF CONDITIONS

9.4.1 The submission of a Bid Proposal will be considered by the Owner as acceptance by the Bidder of all requirements and stipulations contained in the Bidding Documents, and any and all site conditions.

9.5 SITE INSPECTION INFORMATION

9.5.1 The site is available for inspection and must be scheduled in advance. Contractors must set up a time for inspection with Stephen J. Kerr, Asst. State Court Administrator for Facilities, Operations and Security, Rhode Island Administrative Office of State Courts, Licht Judicial Complex, 250 Benefit Street, Providence, RI 02903, 401-222-4999.

9.6 CONTRACT PERIOD AND LIQUIDATED DAMAGES

9.6.1 Bidder must agree to commence work within 10 days after issuance of a written "Notice to Proceed" with the Owner and to substantially complete the project within the time limit indicated on the proposal form.

9.6.2 If the Contractor fails to complete the work within the specified time the Contractor shall pay the Owner as liquidated damages, the sum of $250 dollars per day for each day of delay.

END OF SECTION 00 22 13

SECTION 00 42 13 – BID FORM

TO: State of Rhode Island
Judicial Purchasing Office
Rhode Island Traffic Tribunal
670 New London Avenue, Room 1006
Cranston, RI 02920

PROJECT: Chiller Plant Upgrades
Frank J. Licht Judicial Complex
250 Benefit Street
Providence, Rhode Island 02903

DATE: _____

SUBMITTED BY: _____
(include address _____
tel. no., and _____
license no. as _____
applicable) _____

1. BID

Having examined the Site and all matters referred to in the Bid Information Sheet, the Instructions to Bidders, and the Bidding Documents, we, the undersigned, hereby propose to enter into a Contract to perform the Work for the sum of:

Base Bid

$				**,**				**.**		

(Numeric)

_____

(Written)

We have included the required Bid Security in compliance with the Instructions to Bidders and the allowance of ten thousand dollars ($10,000) in the base Bid.

2. ALTERNATES

BIDDER agrees to be bound by the following alternate prices and scopes of each alternate as specified in section 012300, “Alternates”, and appropriate alternate specific sections.

BIDDER agrees that the cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

BIDDER agrees that costs listed for each alternate includes all costs of related coordination, revision, or adjustment.

Add Alternate Number One – Chilled Water Pump #3

$			,				,				.		

(Numeric)

_____

(Written)

3. ACCEPTANCE

This Bid shall be irrevocable for ninety (90) days from the Bid closing date. If this Bid is accepted by the Owner within ninety (90) days, we will:

a. execute an Agreement subject to compliance with required state regulatory agency approvals as described in the Instructions to Bidders;
b. furnish the required bonds in compliance with the amended provisions of the Instructions to Bidders; and
c. commence work within seven (7) days from the issuance date of the Judicial Purchase Order for the Project.

If we fail to comply with any of the above we immediately forfeit the Bid Security while preserving any additional damages, remedies or rights available to the Owner at law.

In the event our Bid is not accepted within the ninety (90) day period, the Bid Security shall be returned to the undersigned in accordance with the Instructions to Bidders; unless a mutually satisfactory arrangement is made in writing for its retention and validity for an extended period of time.

4. CONTRACT TIME

If this Bid is accepted, we will fully complete the Work in ninety (90) calendar days from the issuance date of the Judicial Purchase Order. The work hours shall be from 7:00 AM to 3:30 PM Monday through Friday. Saturday work may be allowed if requested in writing to Stephen Kerr, Asst. State Court Administrator for Facilities, Operations and Security, Rhode Island Administrative Office of State Courts, Licht Judicial Complex, 250 Benefit Street, Providence, RI 02903.
The Contract completion time may be extended only by written agreement of the parties.

5. ADDENDA

The following Addenda have been received. The noted modifications to the Bidding Documents have been considered and all costs are included in the Bid Sum.

Addendum No. 1, dated _____
Addendum No. 2, dated _____

6. ALLOWANCES

The Bidder shall include in its Base Bid Price an allowance of ten thousand dollars **($10,000)** for additional work that may be required and approved by Owner and Architect. Funds will be drawn from allowances only by a properly executed and approved Change Order. At the closeout of the Contract, funds remaining in allowances will be credited to Owner by Change Order.

LICENSE NUMBER REQUIREMENT:

As requird by Section 5-65-23 of the Rhode Island General Laws my Rhode Island license number for the work to be performed by this firm as prime contractor is:

LICENSE NUMBER:_____

7. REFERENCES

Please submit a list of references with whom you have contracted to do similar work including the dates of service. A minimum of four (4) references are required. Please list all information below:

Company Name	Contact Person	Telephone #	Dates of Service

Have you or your firm been subject to suspension, debarment or criminal conviction by the AOSC, the State of Rhode Island, or any other jurisdiction?
Yes: _____ No: _____

Has the AOSC and/or the State of Rhode Island ever terminated contracts with your firm for cause?
Yes: _____ No: _____

Has your firm ever withdrawn from a contract with the AOSC and/or the State of Rhode Island during its performance?
Yes: _____ No: _____

Have you or your firm been involved in litigation against the AOSC and/or the State of Rhode Island?
Yes: _____ No: _____

If you answered yes to any of the foregoing, please explain the circumstances below. If you or your firm have been involved in litigation against the AOSC and/or the State of Rhode Island, please include the case caption, case number and status. (If more space is needed, please attach separate sheet and submit with the bid.)

_____

_____

_____

_____

_____

_____

8. BID FORM SIGNATURES

_____ CORPORATE SEAL
(Bidder's Printed Name)

By: _____
(Signature)

Title: _____

Date: _____

END OF SECTION 00 42 13

SECTION 00 43 13 – BID BOND

1. BID BOND

AIA Document A310, Bid Bond - 2010 Edition, as amended, which appears on the following page is an integral part of the Bidding Documents. Provisions not amended or supplemented remain in full force and effect.

END OF SECTION 00 43 13

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

BOND AMOUNT: $

PROJECT:
(Name, location or address, and Project number, if any)

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.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of ,

	(Contractor as Principal) *(Seal)*
(Witness)	*(Title)*
	(Surety) *(Seal)*
(Witness)	*(Title)*

SECTION 00 52 00 – FORM OF AGREEMENT

1. AGREEMENT

AIA Document A101, Standard Form of Agreement Between Owner and Contractor - 2007 Edition, as amended, forms the basis of the Contract between the Owner and Contractor, in addition to the Rhode Island Judicial Purchasing Rules and Regulations and General Terms and Conditions of Purchase, as well as the Judicial Purchase Order issued for the project. Those documents are included on the following pages and are an integral part of the Bidding Documents. Provisions not amended or supplemented remain in full force and effect.

END OF SECTION 00 52 13

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
(In words, indicate day, month and year.)

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

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

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

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

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

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.

ARTICLE 2 THE WORK OF THIS CONTRACT

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.

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 ( ) days from the date of commencement, or as follows:
(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

Portion of Work	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.)

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 alternates, 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.)

Item	Units and Limitations	Price Per Unit ($0.00)

§ 4.4 Allowances included in the Contract Sum, if any:
(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Price

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, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than ( ) days after the Architect 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 Architect may require. This schedule, unless objected to by the Architect, 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 percent (%). 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, suitably stored off the site at a location agreed upon in writing), less retainage of percent (%);

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

.4 Subtract amounts, if any, for which the Architect 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 Architect 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 Architect 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.)

§ 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.)

%

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

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

§ 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:

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:

Document	Title	Date	Pages

§ 9.1.4 The Specifications:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

Section	Title	Date	Pages

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

Number	Title	Date

§ 9.1.6 The Addenda, if any:

Number	Date	Pages

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.)

Type of insurance or bond	Limit of liability or bond amount ($0.00)

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
(Printed name and title)	*(Printed name and title)*

SECTION 00 52 13 – SUPPLEMENTARY FORM OF AGREEMENT

The following supplements modify the "Standard Form of Agreement Between Owner and Contractor," AIA Document A101, 2007. Where any Article is modified or any Paragraph or Subparagraph is modified or deleted, the unaltered provisions of that Article, Paragraph, or Subparagraph shall remain in effect.

ARTICLE 1 – THE CONTRACT DOCUMENTS

Add the following paragraph 1.1:

1.1 The proposed Bidding Documents also include the Rhode Island Judicial Purchasing Rules and Regulations and General Terms and Conditions of Purchase along with any Judicial Purchasing Orders issued for the Project.

END OF SECTION 00 52 13

SECTION 00 61 13 – PERFORMANCE AND PAYMENT BONDS

1. PERFORMANCE AND PAYMENT BONDS

AIA Document A312, Performance and Payment Bond - 2010 Edition, as amended, is included on the following page and is an integral part of the Bidding Documents. Provisions not amended or supplemented remain in full force and effect.

END OF SECTION 00 61 13

AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:
Amount: $
Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount: $
Modifications to this Bond: ☐ None ☐ See Section 16

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Performance Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or **BROKER:**

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

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.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

.1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

.2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

.3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

.2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and

.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	
Address:		Address:	

AIA® Document A312™ – 2010

Payment Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

CONSTRUCTION CONTRACT
Date:
Amount: $
Description:
(Name and location)

BOND
Date:
(Not earlier than Construction Contract Date)

Amount: $
Modifications to this Bond: ☐ None ☐ See Section 18

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:		Signature:	
Name and Title:		Name and Title:	

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)
AGENT or **BROKER:**

OWNER'S REPRESENTATIVE:
(Architect, Engineer or other party:)

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.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

.2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- .4 a brief description of the labor, materials or equipment furnished;
- .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- .7 the total amount of previous payments received by the Claimant; and
- .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		**SURETY**	
Company:	*(Corporate Seal)*	Company:	*(Corporate Seal)*
Signature:	_____	Signature:	_____
Name and Title:		Name and Title:	
Address:		Address:	

SECTION 00 72 13 – GENERAL CONDITIONS

1. GENERAL CONDITIONS

AIA Document A201, General Conditions of the Contract for Construction – 2007 Edition, as amended, is included on the following page and is an integral part of the Bidding Documents. Provisions not amended or supplemented remain in full force and effect.

END OF SECTION 00 72 13

AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

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.

TABLE OF ARTICLES

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INDEX
(Topics and numbers in bold are section headings.)

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. The Contract Documents shall not 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, (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.

§ 1.2 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.

§ 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.

§ 1.3 CAPITALIZATION

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

§ 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 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.

§ 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. 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 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 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.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. 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.

§ 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.

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. 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.

§ 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.

§ 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 Sections 3.2.2 or 3.2.3, 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, 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 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 give timely written notice to the Owner and Architect and 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 without acceptance 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.

§ 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.

§ 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.

§ 3.4 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 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.

§ 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.

§ 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.

§ 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.

§ 3.6 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.

§ 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.

§ 3.8 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 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.

§ 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.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. 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.

§ 3.10.2 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 for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one 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.

§ 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.

§ 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.

§ 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. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 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 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.

§ 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 from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the 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.

§ 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 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 manufacturers 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 indemnify and hold harmless the Owner, 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, 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 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 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.

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 and will be an Owner's representative during construction 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. 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 inferable 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.

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

§ 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, 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.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require 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 the responsibility for safety of the Subcontractor's Work, 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.

§ 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.

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.

§ 6.1.2 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 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 to 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.

§ 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.

§ 7.2 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.

§ 7.3 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 If the Contractor does not respond promptly or disagrees 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 as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 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.

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 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, 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 for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 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.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the 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. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established 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. 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.

§ 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.

§ 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.

§ 9.4 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

- .1 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 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.

§ 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 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.

§ 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.

§ 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 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 seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven 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 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.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof 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.

§ 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 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. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them 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. 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 and (5), 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. 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 retainage 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.

§ 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 loaded so as to cause damage or create an unsafe condition.

§ 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 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 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.

§ 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.

§ 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 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.

§ 10.4 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 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 insured by usual 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.

§ 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.

§ 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.

§ 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.

§ 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.

§ 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.

§ 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.

§ 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.

§ 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.

§ 11.3.6 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, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, 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 as fiduciary and made payable to the Owner as fiduciary 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 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.

§ 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; 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. 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.

§ 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.

§ 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.

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, 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. 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 rights 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.

§ 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.

§ 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.

§ 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. 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 except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 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. 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 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, but in any case 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.

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, 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:

.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

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 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 not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties 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 Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party 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 must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 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 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 herein 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 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein 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.

§ 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.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

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.

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.

§ 15.2 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 Maker 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 binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, 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.

§ 15.3.3 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 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.

§ 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.

SECTION 00 73 00 – SUPPLEMENTAL GENERAL CONDITIONS

The following supplements modify the "General Conditions of the Contract for Construction," AIA Document A201, Fifteenth Edition, 2007. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, the unaltered portions of the General Conditions shall remain in effect.

ARTICLE 1 - GENERAL PROVISIONS

Add the following sub-paragraphs to 1.1:

1.1.1.1 The proposed Bidding Documents also include the Rhode Island Judicial Purchasing Rules and Regulations and General Terms and Conditions of Purchase along with any Judicial Purchasing Orders issued for the Project.

1.1.9 Miscellaneous Definitions

1.1.9.1 The term "product" includes materials, systems and equipment.

1.1.9.2 Where "as directed," "as permitted," "as required," "approved," "acceptance," or words of similar import are used, it shall be understood that the direction, requirement, permission, approval or acceptance of the Architect is intended, unless stated otherwise. As used herein, "provide" shall be understood to mean "provide complete in place" that is, "furnish and install."

1.2 Correlation and Intent of the Contract Documents

Add the following Clause 1.2.3.1 to 1.2.3:

1.2.3.1 The following are all part of the Contract Documents and in the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities.

1. The Agreement.
2. Addenda, with those of a later date having precedence over those of an earlier date.
3. The Supplementary Conditions.
4. The General Conditions of the Contract for Construction.
5. Specifications.
6. Rhode Island Judicial Purchasing Rules and Regulations, the General Terms and Conditions of Purchase, and any Judicial Purchase Order issued for the Project.

Add the following sub-paragraph 1.2.4:

1.2.4 Sections of Division 1- General Requirements govern the execution of all Sections of the Specifications.

ARTICLE 2 – OWNER

2.1.1 Contact Person: Stephen J. Kerr, Asst. State Court Administrator for Facilities, Operations and Security, Rhode Island Supreme Court, 250 Benefit Street, Providence, RI 02903, 401-222-4999.

2.2 Information and Services Required of the Owner

Delete sub-paragraph 2.2.1 without substitution.

Delete sub-paragraph 2.2.2 and substitute the following:

2.2.2 The Contractor shall secure and pay for permits and fees, and necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

Delete sub-paragraph 2.2.5 and substitute the following:

2.2.5 The Contractor will be furnished, free of charge, one CD of the Drawings and Project Manual. The Contractor shall be responsible for all printing of construction documents and assscoiated costs.

ARTICLE 3 - CONTRACTOR

3.2 Review of Contract Documents and Field Conditions by Contractor

Add the following sub-paragraph to 3.2:

3.2.5 Failure of the Specifications to indicate the need for items to properly perform the Work of the Project, such as attachments, bolts, hangers, and other fastening devices, shall not relieve the Contractor from furnishing and installing these items.

3.2.6 Should an inconsistency (or discrepancy) be found in the Contract Documents not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

Add the following sub-paragrah to 3.3:

3.3.4 If the Contractor determines that the Work already performed is not in proper condition to receive subsequent Work, the Contractor shall immediately take all steps necessary to ensure that the proper condition is achieved so that the Work can proceed.

3.4 Labor and Materials

Delete sub-paragraph 3.4.2 and substitute the following:

3.4.2 The Contractor may make substitutions only with the written consent of the Owner, after evaluation by the Architect and in accordance with a properly executed Change Order.

Add the following sub-paragraphs 3.4.4 and 3.4.5 to 3.4:

3.4.4 After execution of the Contract, the Owner and the Architect shall only consider formal written requests for the substitution of products specified in and in accordance with the the General Requirements (Division 1 of the Specifications) and in Article 7 (CHANGES IN THE WORK) of this document.

3.4.5 By making requests for substitutions based on sub-paragraph 3.4.3 above, the Contractor:

.1 Represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to the product specified;
.2 Represents that the Contractor will provide the same warranty for the proposed substitute product that the Contractor would for the product specified;
.3 Certifies that the cost data presented is complete and accurate and includes only those costs directly related to this Contract and excludes any redesign costs of the Architect; 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.

3.6 Taxes

Delete sub-paragraph 3.6. and substitute the following:

3.6 The Owner is exempt from payment of sales taxes for materials directly incorporated into the Work of this Project. Refer to requirements set forth in the General Requirements (Division 1 of the Specifications).

3.7 Permits, Fees and Notices

Add to sub-paragraph 3.7.1:

.1 The Contractor shall contact the Rhode Island State Building Commissioner to determine the amount of permit costs and associated fees or surcharges, if any such permits are needed for the Project.

3.9 SUPERINTENDENT

Add the following to sub-paragraph 3.9.2:

3.9.2 The Contractor shall provide the Owner and the Architect with the Superintendent's name and contact information.

ARTICLE 4 – ARCHITECT

Delete sub-paragraph 4.1.2 and substitute the following:

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 witout written consent of the Owner and Architect. Consent shall not be unreasonably withheld.

Delete sub-paragraph 4.1.3 and substitute the following:

4.1.3 If the employment of the Architect is terminated, the Owner has the option to employ another Architect whose status under the Contract Documents shall be that of the former Architect.

ARTICLE 7 - CHANGES IN THE WORK

7.3 Construction Change Directives

Delete sub-paragraph 7.3.6 and substitute the following:

7.3.6 If a cost is not previously agreed upon, then the Contractor, provided he receives a Construction Change Directive signed by the Owner, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Architect on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change, including in the case of an increase in the Contract Sum, an allowance for overhead and profit as stipulated in 7.3.10. In such cases, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data for inclusion in a Change Order. Pending final determination of cost to the Owner, payments on account shall be made on the Architect's Certificate for Payment.

Add the following sub-paragraph to 7.3.10:

7.3.10 In sub-paragraph 7.3.3 and 7.3.6 the allowance for overhead and profit combined, included in the total cost to the Owner, shall be based on the following schedule:

.1 For the Contractor, for any Work performed by the Contractor's own forces, ten percent (10%) of the cost.
.2 For the Contractor, for Work performed by the Sub-subcontractor, five percent (5%) of the amount due the Subcontractor.
.3 For each Subcontractor or Sub-subcontractor involved, for any Work performed by that Subcontractor's own forces, ten percent (10%) of the cost.
.4 For each Subcontractor, for Work performed by Subcontractors of the Sub-subcontractor five percent (5%) of the amount due the Subcontractor.
.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.11.
.6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor (Less than fifty dollars), shall be accompanied by a complete itemization of costs including labor, materials and subcontracts. Labor and materials shall be itemized in the manner described the above sections (.1 - .4). In no case will a change over fifty dollars ($50.00) be approved without such itemization.

7.3.11 Cost, as referred to throughout Article 7, shall be limited to the following costs directly attributable to the change: cost of materials, including cost of delivery; cost of labor, including social security and unemployment insurance, fringe benefits required by agreement or custom; Workmen's compensation insurance; rental value of tools (excluding small/hand tools), equipment and machinery.

7.3.12 Overhead, as referred to throughout Article 7, shall include the following expenses directly attributable to the change: cost of bond and insurance premiums, additional cost of supervision and superintendence, wages of time-keepers, watchmen and clerks, small/hand tools, incidentals, general office expense, and all other expenses directly attributable to the change and not included in "Cost".

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

7.3.14 Subsequent to the approval of a Change Order, whether involving a change in Contract Sum, contract time or both, no additional claim related to that change will be considered by the Owner. A change incorporated into a Change Order is

therefore all inclusive, and includes such factors as Project impact, schedule "ripple" effect or other items which may pertain to such change.

ARTICLE 9 - PAYMENTS AND COMPLETION

9.3 Application for Payment

Add the following sentences to sub-paragraph 9.3.1:

The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet.

9.4 Certificate for Payment

Add the following new sub-paragraphs:

9.4.3 First Certificate for Payment - The Architect will process the first Certificate for Payment only after receipt of: 1). the information required for Article 7 of the Instructions to Bidders; 2). certification from the Contractor that it is maintaining current Record Drawings

9.4.4 Second and Subsequent Certificates for Payment - The Architect will process the second and subsequent Certificates for Payment only after receipt of: 1). certification that the Contractor is maintaining current Record Drawings, 2). Release of Liens, 3). all the proposed material and color samples and selections have been submitted for the Architect's approval. The Architect will not process any Certificates for Payment without certification from the Contractor that the Record Drawings are current and without having received all Release of Liens forms.

9.5 Decisions to Withhold Certification

Add the following Clause .8 to 9.5.1:

.8 Failure to maintain current Record Drawings.

9.6 Progress Payments

Add the following to sub-paragraph 9.6.1:

9.6.1 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 in the Contract Documents for the period ending the last day of the month as follows:

Payments shall be made not more than once per month. Ninety percent (90%) of the portion of the Contract Sum properly allocatable to labor, materials and equipment incorporated in the Work and ninety percent (90%) of the portion of the Contract Sum properly allocable to materials and equipment suitably stored at the site or at some other location agreed upon in writing, for the period covered by the Application for Payment, less the aggregate of previous payments made by the Owner; and upon Substantial Completion of the entire Work, a sum sufficient to increase the total payments to ninety-seven percent (97%) of the Contract Sum, less such amounts as the Architect shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents. If in the opinion of the Architect, the Work progresses satisfactorily after fifty percent (50%) of the Work is completed, the Architect may recommend to the Owner that the retainage be decreased to five

percent (5%). Such reduction shall occur upon the Owner's approval and after receipt of AIA Document G707A (Consent of Surety to Reduction).

Add the following sub-paragraph to 9.6.1:

9.6.1.1 The Owner reserves the right to withhold payment to the Contractor, in whole or in part, for any or all of the reasons cited in Clauses 9.5.1.1 through 9.5.1.8.

9.7 Failure of Payment

Delete paragraph 9.7 and substitute the following:

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within thirty (30) 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 ten (10) additional days' written notice to the Owner and the Architect, stop 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 shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

9.8 Substantial Completion

Add the following sentence to sub-paragraph 9.8.4:

Prior to the issuance of a Certificate of Substantial Completion, and in addition to requirements herein, the Contractor and his subcontractors shall submit: 1). their respective certificates of Contract Document compliance; 2). all warranties and guarantees; 3). bonds; 4). all certifications and affidavits; 5). operating manuals, report of Owner instructions, and test results; 6). Project record documents, including Record Drawings; 7). extra materials and samples (as specified) required for Owner; and 8). any permits, including occupancy permit (if requested), and notices.

9.10 Final Completion and Final Payment

9.10.2 Add the following sentence:

The Contractor shall submit AIA Document G706, Contractor's Affidavit of Payment of Debts and Claims, and G706A, Contractor's Affidavit of Release of Liens, to satisfy number the affidavits required by (1) above, and AIA Document G707, Consent of Surety Company to Final Payment, to satisy the consent required by number (4) above.

Add the following sub-paragraphs:

9.10.6 Certificates for Payment seeking final payment by the Contractor will not be processed unless and until Architect has received from the Contractor Release of Lien forms from all subcontractors and material suppliers indicating that they have been paid in full for all Work covered by prior Certificates for Payment.

9.10.7 The Contractor shall immediately satisfy all liens or encumbrances which, because of any act or default of the Contractor is filed against the premises, and shall indemnify and hold the Owner harmless against any and all claims (including without

limitation subrogation claims), loss, liability, damages, costs, and expenses (including without limitation court costs and legal fees), of any kind whatsoever, and any and all legal actions including third-party actions, cross-actions, and/or claims for contribution and/or indemnity with respect to any claims by any person, entity, and/or party, which relate to or arise out of the Project. In addition, moneys due under the Contract may be retained by the Owner until all such suits, claims for damages or expenses as aforesaid shall have been settled and paid.

9.10.8 The statement on the Standard AIA Form G702, Certificates of Payment, which certifies that "all bills are paid for which previous certificates for payment were issued" shall be notarized by a Notary Public currently licensed in the State of Rhode Island.

ARTICLE 11 - INSURANCE AND BONDS

11.1 Contractor's Liability Insurance

11.1.1 Replace the words “in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located” insert the words "in a company or companies licensed to do business in the State of Rhode Island and to which the Owner has no reasonable objection.”

Add the following sub-paragraphs to 11.1.1:

.9 Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises Operations (including X-C/U as applicable).
2. Independent Contractor's Protective.
3. Products and Completed Operations.
4. Personal Injury Liability with Employment Exclusion deleted.
5. Contractual-including specified provisions for Contractor's obligation under Paragraph 3.18.
6. Owned, non-owned and hired motor vehicles.
7. Broad Form Property Damage including completed operations including explosion, collapse, and underground.

.10 If the General Liability coverages are provided by a General Liability Policy on a claims-made basis, the policy Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified in accordance with subparagraph 9.10.2.

Add the following sub-paragraph to 11.1.2:

11.1.2 Add the following sentence:

The Owner shall be named as an additional insured on the insurance required by Section 11.1.1 and the coverage shall include liability arising out of completed operations and shall provide coverage for the sole negligence of the Owner as an additional insured.

11.1.2.1 The insurance required by sub-paragraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:

1. Worker's Compensation:

(a)	State:	Statutory
(b)	Employer's Liability:	$500,000

2. Comprehensive General Liability (including Premises Operations; Independent Contractor's Protective; Products and Completed Operations; Broad Form Property Damage):

(a) Bodily Injury:

$1,000,000.	Each Person
$1,000,000.	Each Occurrence
$1,000,000.	Annual Aggregate

(b) Property Damage:

$500,000.	Each Occurrence
$1,000,000.	Annual Aggregate

(c) Products and Completed Operations to be maintained for one (1) year after final payment.

(d) Property Damage Liability Insurance shall provide X,C or U coverage as applicable.

3. Contactual Liability:

(a) Bodily Injury:

$1,000,000.	Each Occurrence

(b) Property Damage:

$1,000,000.	Each Occurrence
$1,000,000.	Annual Aggregate

4. Personal Injury, with Employment Exclusion deleted:

$1,000,000.	Annual Aggregate

5. Comprehensive Automobile Liability:

(a) Bodily Injury:

$500,000.	Each Person
$1,000,000.	Each Occurrence

(b) Property Damage:

$500,000.	Each Occurrence

Add the following sub-paragraph to 11.1.3:

11.1.3.1 The Contractor shall provide the Owner with one (1) Certificate of Insurance reflecting the Owner as an additional insured for all insurance required in Article 11

no later than forty-eight (48) hours prior to commencement of any Work on the Project. If the Contractor's Liability Insurance is written on the Comprehensive General Liability policy form, the Certificates shall be AIA Document G705, Certificate of Insurance. If this insurance is written on a Commercial General Liability policy form, ACCORD for 25S will be acceptable. The Contractor shall provide the Owner with copies of endorsements with each Certificate of Insurance evidencing the Owner's additional insured status, waivers of subrogation waiving any right to recovery the insurance company may have against the Owner, and showing that the requisite coverage remains on each policy. Any deductible or self-insured retention amount or other similar obligation under any of the policies required under Article 11 shall be the sole responsibility of the Contractor.

11.2 Owner's Liability Insurance

Delete the sub-paragraph 11.2 in its entirety.

11.3 Property Insurance

Delete sub-paragraph 11.3.1 in its entirety and substitute the following:

11.3.1 The Contractor shall purchase and maintain, in a company or companies licensed to do business in the State of Rhode Island, property insurance for the entire Work at the site in the amount of the initial Contract Sum, plus value of subsequent Contract . Such insurance shall be in a company or companies against which the Owner has no reasonable objection. The Owner, the Contractor, Subcontractors and Sub-subcontractors shall all be listed as additional insureds and said insurance shall protect against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss or damage including, without duplication of coverage theft, vandalism, and malicious mischief. The Contractor shall also purchase and maintain this type of property insurance on portions of the Work stored offsite or in transit when such portions of the Work are to be included in an Application for Payment under sub-paragraph 9.3.2 and such portions of the work would not otherwise be covered under the "all risk" insurance policy required above and/or such insurance is otherwise required by the Contract Documents. Forty eight (48) hours before the commencement of the Work, the Contractor shall furnish the Owner with Certificates of Insurance and copies of endorsements proving that such coverage exists.

Add the following sentence to Clause 11.3.1.1:

11.3.1.1 The form of policy for this coverage shall be Completed Value.

11.3.1.2 Delete Clause 11.3.1.2.

11.3.1.3 Delete Clause 11.3.1.3.

11.3.2 Delete Sub-paragraph 11.3.2.

11.3.3 Delete Sub-paragraph 11.3.3.

11.3.4 Delete Sub-paragraph 11.3.4.

Delete sub-paragraph 11.3.6 in its entirety and substitute the following:

11.3.6 The Contractor shall file two (2) certified copies of all policies required under Article 11 with the Owner forty eight (48) hours prior to the commencement of the Work.

Each policy shall contail all generally applicable conditions,definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy and endorsements may not be cancelled, modified, or allowed to expire without at least thirty (30) days prior written notice to the Owner. The failure to provide the requisite insurance is a material breach of contract entitling the Owner to immediately terminate its agreement with the Contractor. If the Owner is damaged by the failure of the Contractor to maintain the requisite insurance and to so notify the Owner, then the Contractor shall bear all reasonable costs properly attributable thereto.

11.3.7 Modify sub-paragraph 11.3.7 substituting "Contractor" for "Owner" as fiduciary at the end of the first sentence.

11.3.8 Modify sub-paragraph 11.3.8 by substituting "Contractor" for "Owner " as fiduciary; except that at the first reference to "Owner" in the first sentence, the word "this" should be substituted for "Owner's".

11.3.9 Modify sub-paragraph 11.3.9 by substituting "Contractor" for "Owner" each time the latter word appears except in the last sentence (only the Owner can terminate for convenience).

11.3.10 Modify sub-paragraph 11.3.10 by substituting "Contractor" for "Owner" each time the latter word appears.

Delete sub-paragraph 11.4.1 and substitute the following:

11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds must be secured through a surety company licensed to do business in the State of Rhode Island and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to one hundred percent (100%) of the Contract Sum.

11.4.1.1 The Contractor shall deliver the required bonds to the Owner on or before the date the Agreement is executed.

11.4 Performance Bond and Payment Bond

Add the following sentence:

11.4.3 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 12 - UNCOVERING AND CORRECTION OF WORK

Acceptance of Nonconforming Work

Add the following sentence to 12.3.1:

Acceptance by the Owner of any nonconforming Work must be in writing.

ARTICLE 13 - MISCELLANEOUS PROVISIONS

13.6 Interest

Add the following clause to the end of 13.6:

and as otherwise permitted by law.

Add the following paragraph 13.8 to Article 13:

13.8 Equal Opportunity

13.8.1 The Contractor shall maintain policies of employment as follows:

13.8.1.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin.

Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of nondiscrimination.

13.8.1.2 The Contractor and the Contractor's Subcontractor's shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

13.8.1.3 The Contractor shall be a signatory to the requirements of the Rhode Island Equal Employment Office.

Add the following paragraph 13.9 to Article 13:

13.9 Prevailing Wage Schedules on Public Works Projects

13.9.1 In accordance with the General Laws of Rhode Island the Department of Labor determined the customary and prevailing rate of wages paid to craftspersons, teamsters, and laborers in the constructing of public Works by the State, and by cities and towns, and by persons contracting therewith for such construction. Violators are subject to fine of not more than One Hundred Dollars ($100.00) for each offense.

13.9.2 The wage rates as ascertained by the Department of Labor are uniform for the State of Rhode Island and as of the date of advertisement of Contract applying to the life of the Contract. Information concerning wage rates prevailing in the construction industry in Rhode Island may be obtained from the Office of the State Department of Labor, 220 Elmwood Avenue, Providence, Rhode Island. Under no condition shall the wages paid on this Project be less than those designated in the general classification. This clause does not relieve the Contractor or his Subcontractors from respecting any other union regulations to which he ordinarily subscribes.

13.9.3 Bulletin No. 3, State Labor Laws, issued by the Rhode Island Department of Labor, pertaining to Public Works Projects (General laws of Rhode Island, Revision of 1956, Chapter 37-12 as amended, and Chapter 77, Public Laws of 1965), are hereby made a part of this Project. These laws include, but are not limited to:

.1 Weekly payment of employees;
.2 Provisions applicable to public Works contracts;
.3 Payment of prevailing wage rates;
.4 Posting of prevailing wage rates and;
.5 Overtime compensation.

ARTICLE 14 – TERMINATION OR SUSPENSION OF THE CONTRACT

Delete clause 14.1.1.4 in its entirety.

Delete sub-paragraph 14.2.1.4 and substitute the following:

14.2.1.4 otherwise fails to satisfactorily fulfill or perform any obligations, promises, terms, or conditions of the Contract Documents.

Delete paragraph 14.2.3 and insert the following:

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.

Add the following sentence to clause 14.2.4

14.2.4 Such payment does not limit other damages recoverable by the Owner at law.

14.4 Termination by the Owner for Convenience

Delete sub-paragraph 14.4.3 and substitute the following:

14.4.3 Within thirty (30) days of the effective date of the termination of the contract by the Owner, the Contractor shall submit to the Architect an Application for Payment for any unpaid Work performed up to the date of termination. Such application shall proceed in the ordinary course as provided herein.

ARTICLE 15 – CLAIMS AND DISPUTES

15.4 ARBITRATION

Delete section 15.4 entitled ARBITRATION in its entirety and all references to arbitration in "AIA General Conditions, A201, 2007" and substitute the following:

Arbitration shall be in accordance with the provisions of the State Arbitration laws (State of Rhode Island, General Laws, Title 37, Chapter 16), which shall take precedence and shall govern.

ARTICLE 16 - SPECIAL PROJECT WORK CONDITIONS

16.1 Coordination

A. Prior to commencement of subcontract Work, a designated representative of each subcontractor shall meet with the Project superintendent and Owner's Representative at the site and at the time set by the Owner’s Representative to discuss requirements and the scope of Work.

B. The General Contractor and all subcontractors will be required to attend a preconstruction conference at a date and time set by the Owner's Representative.

16.2 Behavior of Personnel

A. If in the opinion of the Owner's Representative, any employee of the Contractor, a subcontractor and/or a sub-subcontractor is physically or mentally unfit for Work or exhibits behavior incompatible with Work site environment, said employee may be required to leave the property and may be refused re-admittance.

B. Employees of the Contractor, subcontractor and/or sub-subcontractor shall abide by the State's drug-free workplace policy and shall so attest upon request by the Owner by signing a certificate of compliance.

C. Employees of the Contractor, subcontractor and/or sub-subcontractor shall be familiar with special regulations, policies and procedures in effect at the site and comply with such rules, including but not limited to security policies or practices and/or criminal background checks.

D. At all times while Work is performed at the site at least one employee of the Contractor, subcontractor and sub-subcontractor shall have a good command of the English language and must be able to effectively communicate with the Owner and its staff.

E. Employees of the Contractor, subcontractor and/or sub-subcontractor shall not disclose any confidential information of the Ower to any third party. Confidential information means: (1) any information of a sensitive or proprietary nature, whether or not specially identified as confidential or proprietary; or (2) any information about the Owner gained during the performance of a contract that is not already lawfully in the public domain.

16.3 Substitutions

A. In all cases where a proprietary designation is used in connection with materials or articles to be furnished under this contract and the phrase "or equal" is not used, the Contractor shall furnish the specified item, unless a written request for a substitute has been submitted by the Contractor and written approval is issued by the Owner.

B. See Section 01 60 00, Paragraph 1-06 for additional requirements and Contractor responsibility relating to substitutions. Specifically subparagraphs relating to speculative substitutions and additional liabilities.

16.4 Codes, Rules and Regulations

A. All Work is to be in accord with the latest requirements of:

1. Federal, State and Municipal Laws;
2. Rhode Island Building and Fire Codes; and
3. Any prevailing rules and regulations pertaining to the adequate protection and/or guarding of any moving parts or other hazardous locations.

B. Reference in Specifications or Drawings shall mean and intend the latest edition of such, as published at date of submission of bids.

C. Reference to technical society organizations or body is made per the following abbreviations:

AIA	American Institute of Architects
AISE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ASA	American Standards Association
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
AWSC	American Welding Society
CS	Commercial Standard of U.S. Dept. of Commerce
FS	Federal Specifications
NBS	National Bureau of Standards
NEC	National Electric Code
UBC	Uniform Building Code
UL	Underwriters' Laboratories, Inc.
AASHO	American Assoc. of State Highway Officials

D. All Contractors and Subcontractors shall comply with requirements of the Occupational Safety and Health Act of 1970 or revisions thereto, which are applicable during the term of this Contract and hold the Owner and/or his agents harmless from any claim or loss that may result from violations of or claims under this act.

E. Nothing in the Specifications or Drawings is to be construed to allow Work not in accord with the above requirements. When requirements shown or specified are less than those in the codes listed above, the Contractor is to furnish and/or install the larger size or higher standard without extra cost to the Owner.

F. All Contractors and material/equipment suppliers shall comply with the Lead Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4826) and H.U.D. implementing regulations and the Rhode Island General Laws.

16.5 Drawings

A. Structural drawings need not show architectural finishes. Architectural drawings need not show completed structural and/or mechanical or electrical installation or vice versa.

B. Architectural drawings shall have precedence over all other drawings.

C. All Work drawn on plans and not specified, or all Work specified and not drawn are part of Contract Work required to be done and are to be executed as fully as if described in both of these ways. Only Work specifically noted in the following manner shall be considered as not being in the contract:

"...by Owner"
"...NIC (Not In Contract)

D. If, after examination of Contract Drawings and Specifications, or after a visit to the premises, any discrepancies, omissions, ambiguities, or conflicts are found in the Contract Documents or there is doubt as to their meaning, the Architect is to be notified immediately, in writing. Where information sought is not clearly indicated or specified, the Architect will issue addendum to the Contractor clarifying conditions and which addendum will become part of the Contract Documents. Neither the Owner nor the Architect will be responsible for any oral instructions.

E. If there are two (2) ways and/or instruction in drawings and/or specifications, it shall be assumed that the Contractor has based its Base Bid price on the most expensive way.

F. If duplication is shown on drawings and/or specifications of Work by more than one (1) trade, Owner shall determine which trade shall do Work and rebate shall be due from the other trades to Owner.

G. Drawings DO NOT include any necessary components for construction safety.

H. In all work shown on Drawings, figured dimensions are to be followed in all cases, though they may differ from scaled measurements. Before beginning the work, Contractor is to check through and verify all dimensions/elevations and call to the attention of the Architect any apparent or manifest discrepancy.

1. Contractor shall verify all dimensions with existing and actual field conditions, prior to start of any work.

I. All work and materials shown on drawings shall be interpreted by the Contractor as being new work and materials to be furnished and installed unless they are specifically indicated as being existing and to remain.

16.6 Manufacturer's Directions

A. Manufactured articles, materials and equipment must be applied, installed, connected, erected, used, cleaned, and / or conditioned in accordance with manufacturer's printed directions unless specified to the contrary.

B. If there is a conflict between the Contract Documents and manufacturer's directions, the Contractor shall notify the Architect in writing. Contractor shall not proceed with Work until Architect has reviewed the conflicting data and provided the Contractor with a decision on which specification to follow.

16.7 Dimensions

A. In all Work shown on Drawings, figured dimensions are to be followed in all cases, though they may differ from scaled measurements before beginning the Work, Contractor is to check through all dimensions and call to the attention of the Owner for adjustment any apparent or manifest discrepancy. Contractor shall verify all dimensions with existing and actual field conditions prior to start of construction and assumes all responsibility regarding the same.

16.8 Foreign Corporations

A. The attention of the General Contractor is hereby directed to excerpts from Chapters 1 - 6 of Title 7 of the General Laws of Rhode Island, 1956, relative to the conditions precedent, etc. to carrying on business within the State for foreign corporations.

B. The certificate and power of attorney mentioned in the General Corporations Law, properly filled out, subscribed and sworn to and accompanied by a certified copy of the charter, articles of association, or other similar organization papers, together with all amendments, must be filed in the Office of the Secretary of State by all foreign corporations intending to carry on business within this State, or for a foreign corporation to enforce in the courts of this State any contract made within the State.

C. Detailed information regarding Chapters 1 - 6 of Title 7 of the General Laws of Rhode Island, 1956, relative to the conditions precedent, etc., to carrying on business with this State for Foreign Corporations may be obtained from the Rhode Island Secretary of State, State House, Smith Street, Providence, Rhode Island or by going to www.state.ri.us.

16.9 Contractor’s Agreement

A. During the performance of this contract, the Contractor agrees to comply with all provisions of Executive Order 11246, as amended, relative to the Equal Employment Opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the Secretary of Labor.

B. In the event of the Contractor's non-compliance with the non-discrimination clauses of this contract or with any such rules, regulations or orders, this contract may be cancelled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further contracts.

16.10 General Specification Note

A. The paragraph entitled "WORK INCLUDED" in each section of the technical specifications shall be considered general in nature and NOT all inclusive. The intent of the paragraph is to provide a general guide of what is included in the section.

B. The paragraph entitled "RELATED WORK" in each section of the technical section shall be considered general in nature and NOT all inclusive. The intent of the paragraph is to provide a general guide of what Work is related to Work included in this section.

16.11 Signs

A. Contractors, subcontractors and sub-contractors are prohibited from displaying signs of any kind at the site, including advertisements, except as approved by the Owner or as required by authorities having jurisdiction.

16.12 Drawings and Specifications

A. Contract Drawings and Specifications, one (1) CD will be furnished to the Contractor without cost. Printing of hard copies for contractor’s use shall be the responsibility of the contractor. Printing of hard copies for permits and approvals shall be by owner.

16.13 Work Not Specified

A. Work shown on drawings concerning which there are no particular specification shall not relieve Contractor from furnishing and installing same. Contractors shall review plans carefully for miscellaneous Work not specified and shall perform such Work with materials and Workmanship of the highest quality.

16.14 Meaning and Intent

A. The Contractor shall provide items such as attachments, hangers, bolts ands screws, which are obviously needed to perform Work properly but are not specifically indicated on the drawings and specifications.

B. INTENT: It is the intent of the plans and these specifications that all design, equipment, materials and Workmanship used on this Project be in complete conformance with all local, state and national codes, ordinances and standards. It is the Contractor's responsibility to submit only those items that meet these codes. Should an item be inadvertently specified by model number that is not in conformance with local and state codes, the Contractor shall notify the proper authorities prior to any submittals of the item. Regardless of any approval action given, it is the Contractor's responsibility to install only those items that are in conformance with applicable codes. Should any non- conforming code items be installed, they shall be replaced by the Contractor at no additional cost to the Owner.

16.15 Use of the Premises

A. Since the premises are occupied, Work is to be done as expeditiously as possible and with as little inconvenience as possible and without danger to occupants. The Contractors, subs, etc. shall conduct Work in such manner as to allow continued operation with minimum of interference, use and function of the buildings and premises and schedule Work in consultation with Owner or his representative. The Contractor shall leave unobstructed ways along roadways and walks, except as approved by Owner in writing and restrict introduction of materials and access and egress of Workmen and vehicles to such places as approved by Owner. The Contractor shall notify the Owner no later than twenty four (24) hours prior to any interference, obstruction and restriction on the Owner’s use of the premises and await Owner’s written approval prior to such interference. All floors, wall surfaces and ceilings shall be protected during construction.

16.16 Existing Utilities and Structures

A. All existing utilities are NOT indicated on the drawings. Contractors shall use caution during construction and assume all responsibility for damage to utilities except as otherwise expressly provided herein. The Owner will cooperate fully, at the Contractor's written request, in assisting the contractor in locating and identifying underground utilities.

B. The Contractor shall take all precautions to prevent any damage to utilities and structures encountered during the Work and ensure that they remain in constant operation except as may be required to connect or disconnect from them and shall immediately repair any active existing utility lines (cables, conduits, ducts, and piping) damaged during the performance of the Work except where such lines are to be abandoned. The Contractor shall be responsible for any and all damages to utility piping, drains, sewers, electrical wiring and conduits, buildings and/or other structures that may be met within the performance of the Work including damages

caused by Subcontractors, Sub-subcontractors and material manufacturers, their agents or employees.The Contractor shall protect and maintain such active existing utilities in use, until relocation of same has been complete or cut, or capped, or prepared for service connections, as applicable; and perform such repair and protection Work at no additional cost to the Owner. The Contractor shall put in place shores, slings and/or other devices necessary to prevent such damage.

C. The Contractor shall notify the Owner in writing not less than three (3) days in advance of the proposed time for shutting down or interrupting any utilities, services or facilities which may affect the operation of other buildings, services or facilities of the Owner. Unless otherwise authorized by the Owner, the Contractor shall schedule and coordinate this Work such that interruption will occur on weekends, holidays or before or after normal Working hours of the Owner's facility. In no case shall any shutdown or interruption of any utilities, services or facilities be made without the prior written approval and the authorization of the Owner.

16.17 Protection of Persons and Property

A. The Contractor shall provide and maintain, for the duration of the Contract, proper protective measures as may be required to adequately protect the Owner's personnel and the public from hazards resulting from the Work performed hereunder.

B. The Contractor shall take all proper precautions to protect the Owner's property from damages and replace, or put in good condition, any existing items which are damaged in carrying out the Work, unless designated to be permanently removed or demolished.

C. When regulated by local building code or other Authority, such requirements for protection shall be considered as minimum requirements and the Contractor shall be responsible for the protection of such minimum requirements as may be required by public safety laws.

D. The requirements of this paragraph shall be in addition to, not in lieu of, other protection requirements contained in the Contract Documents.

16.18 Damage from the Elements

A. The Contractor will be held responsible for all damage to new and existing construction and damage and/or loss to any and all materials and/or equipment located at the site from the elements until acceptance by the Owner.

B. The intent of this paragraph is to protect the Owner against claims made for reimbursement in cases where materials are improperly stored, protected or erected in such a manner that rain, snow, sunlight or other normal damage to these materials from the elements would result. Unforeseen natural disasters, etc., are presumed to be covered by the usual forms of property damage insurance maintained by the Contractor.

16.19 Safety and Health

A. The Contractor shall provide protective devices required by authorities having jurisdiction. The contractor shall take, use, provide and make all proper, necessary and sufficient precautions, safeguards and protection against occurrence of any accident, injury to any person or object during progress of Work. The contractor

shall provide and erect temporary fences, guards, etc., required to protect Owner's employees, the public and/or Workmen, and remove same when the Work is completed. The contractor shall keep all passageways clear and safe, and comply with provisions of the following Federal Laws and regulations, as amended:

1. Occupational Safety & Health Act of 1970, Public Law 91-596.
2. Part 1510-Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations.
3. Chapter XIII of Title 29, Code of Federal Regulations, Part 1518-Safety and Health Regulations of Construction. (36 FR 75)
4. Any and all other applicable state or federal laws, codes,and/or regulations.

16.20 Indemnification

A. To the fullest extent permitted by law and notwithstanding any approvals or instructions which may be obtained from Owner in connection with use of premises, the Contractor agrees to indemnify and save the Owner and Architect harmless from and (1) against any and all claims, loss, liability, injury including death, damage or costs by any person, firm, corporation or other entity including without limitation those claiming by, through or under the Contractor, its officers, agents, servants, employees, parents, subsidiaries, partners, officers, directors, attorneys, insurers, and/or affiliates, in any capacity whatsoever, including all subrogation claims and/or all claims for reimbursement, including court costs and attorneys fees and/or any other costs of defending an action arising out of or resulting from the Work provided for or performed under the Contract Documents or from any act, omission, or negligence of the Contractor, Subcontractors and their agents, or employees; and (2) any and all legal actions including third-party actions, cross-actions, and/or clams for contribution and/or indemnity with respect to any claims by any other persons, entities, parties, which may arise out of or result from the Work provided for or performed under the Contract Documents. The foregoing provisions shall not be deemed to be released, waived or modified in any respect by reason of any surety or insurance provided by the Contractor under the Contract.

B. To the fullest extent permitted by law, the Contractor, subcontractors, sub-subcontractors, their officers, agents, servants, employees, parents, subsidiaries, partners, officers, directors, attorneys, insurers, and/or affiliates, release, waive, discharge and covenant not to sue the Owner, its officers, agents, servants and/or employees for any and all liability, claims, cross-claims, rights in law or in equity, agreements, demands, actions and any causes of actions whatsoever arising out of or related to any loss, damages, expenses (including without limitation any court costs and attorneys fees, interest and penalties) or injury of any type, kind or nature whatsoever (including death), whether based in contract, tort, warranty, or other legal, statutory, or equitable theory of recovery, which relates to or arises out of the Work provided for or performed under the Contract Documents.

C. The Contractor shall reimburse the Owner for any and all damage to its real or personal property caused by the acts of the Contractor, Subcontractors, Sub-subcontractors, their agents or employees.

D. The duties of Contractor, Subcontractors, etc. under this section shall remain fully in effect and binding in accordance with the terms and conditions of the Contract, without being lessened or compromised in any way, even when the Contractor is alleged or is found to merely have contributed in part to the acts giving rise to the claims and/or where the Owner is alleged or is found to have contributed to the acts giving rise to the claims.

E. Asbestos Material Identification and Removal: During demolition operations, it shall be the responsibility of the Contractor to identify any asbestos meterials that may be encountered. Should they be encountered, the Contractor shall immediatey notify the Owner, stop Work in the area of concern, and not proceed with any work in that area until further notice. It is understood and agreed that the handling or removal of asbestos or asbestos products involves certain health risks which require specific safety measures. The Architect and Owner shall not be responsible for safety and safety measures on the job, including measures for the protection of employees of Contractor, Subcontractors, Sub-subcontractors, their employees and agents, nor for the protection of the general public. Such responsibility for safety and safety measures is and shall remain that of the Contractor. The Contractor, Subcontractors, Sub-subcontractors, their employees and agents, shall hold harmless and indemnify the Architect and Owner from all claims, suits, expenses and/or damages arising from or alleged to arise from exposure to or inhalation of asbestos or asbestos fibers.

16.21 Reports and Information

A. Performance of the Work under this contract will be monitored. The Contractor, Subcontractors, Sub-subcontractors, their employees and agents shall provide information,as may be requested, in form as required by the Owner or Architect, pertaining to matters covered by this contract.

16.22 Clean Air and Water

A. The Contractor shall comply with requirements of Section 114 of the Clean Air Act, as amended, 42 USC § 1857 *et seq.* and Section 308 of Clean Water Act, as amended, 33 USC § 1318 and regulations and guidelines issued thereunder. The Contractor shall not use any facility listed on List of Violating Facilities issued by Environmental Protection Agency (EPA) pursuant to 40 CFR § 15.20.

16.23 Records

A. The Contractor shall maintain records with respect to matters covered by this Contract for a period of three (3) years after receipt of final payment including, but not limited to, costs, supported by checks, properly executed payrolls, time records, invoices, contracts, vouchers, accounting and other documents evidencing nature and propriety of charges or conditions of employment or purchasing, and shall maintain the records in a manner that they are readily accessible, clearly identified and available for audit by the Owner.

16.24 Overhead and Profit

A. The maximum allowance for overhead and profit combined, included in the total cost to the PHA, shall be based upon the following schedule:

1. For the Contractor, for any work performed by his own forces, maximum of 10% of the cost;
2. For the Subcontractor involved, for any work performed by his own forces, maximum of 10% of the cost;
3. For the Contractor or Subcontractor, for work performed by their Subcontractor, maximum 5% of the cost, not including overhead and profit, due the Subcontractor or Sub-subcontractor.

END OF SECTION 00 73 00

SECTION 00 73 46 – WAGE DETERMINATION SCHEDULE

The State of Rhode Island Department of Labor, Division of Professional Regulation General Decision Modification document current as of the RFP issuance date for this Project, is an integral part of the Bid Documents for use in fulfilling prevailing wage rate requirements. A copy is available on the web site of the State of Rhode Island Department of Administration, Division of Purchases.

The Division of Purchases Web Site Address:

www.purchasing.ri.gov

Click on “General Information”; then click on “Prevailing Wage Tables”.

END OF SECTION 00 73 46

SECTION 01 10 00 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Work by Owner.
5. Work under separate contracts.
6. Owner-furnished products.
7. Access to site.
8. Work restrictions.
9. Specification and drawing conventions.
10. Miscellaneous provisions.

1.3 PROJECT INFORMATION

A. Project Identification: Chiller Plant Upgrades, Frank J. Licht Judicial Complex, Providence, Rhode Island.

1. Project Location: 250 Benefit Street, Providence, Rhode Island 02903.

B. Owner: Rhode Island Judiciary, 250 Benefit Street, Providence Rhode Island 02903.

Owner's Representative: Steven J. Kerr, Asst. State Court Administrator for Facilities, Operations and Security, RI Supreme Court

C. Architect: Edward Rowse Architects, Inc., 400 Massasoit Avenue, Suite 300, 2nd Floor, East Providence, Rhode Island 02914

1.4 DEFINITIONS

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

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

1.5 WORK COVERED BY CONTRACT DOCUMENTS

A. Work of this Contract is comprised of the removal of two existing 250 ton chillers and replacing them with two new 250 ton high efficiency chillers. It also includes removing the existing building chilled water pumps and condenser water pumps and replacing them with new pumps equipped with energy saving VFD motors. The new chillers and pumps will operate as a variable primary flow chilled water distribution system. The new chillers will utilize a new transformer installed in the chiller room and all of the new equipment electrical feeds will be will be fed from the existing main electrical switchgear service.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.6 WORK BY OWNER

A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the Work of this Contract with work performed by Owner.

1.7 ACCESS TO SITE

A. General: Contractor shall be restricted to areas outlined under the contract. The Courts shall remain in full function during the time of construction. Contractor's use of Project site is limited by Owner's right to perform work or to retain other contractors on portions of Project.

1. Driveways, Walkways and Entrances: Contractor access to the building shall be the courtyard front entry off South Main Street. Keep driveways, parking areas, loading areas and entrances serving premises clear and available to Owner, Owner's employees, public and emergency vehicles at all times.

a. Bidders be advised that the South Main Street courtyard is off limits to all transportation of equipment at all times due to the brittle nature of the courtyard’s stone pavers. Costs associated with repairing any damage to the

courtyard stone pavers that is a result of work performed under this contract shall be paid by the contractor.

b. Coordinate closure, use and construction in this area with the Owner. The Owner requires a minimum of 7 days notification of Contractor's intent to close off this roadway.
c. Contractor shall indicate on construction schedule proposed closure, use and construction dates / times in this area.
d. Schedule closures, construction, deliveries, etc. to minimize use of roadway and entrance by construction operations.
e. Schedule deliveries to minimize space and time requirements for delivery of materials and equipment on-site.

1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work to working hours of 7:00 a.m. to 3:30 p.m., Monday through Friday, unless otherwise indicated.

1. Specific crane work and/or rigging shall not be done during the evening or on Saturdays.
2. Deliveries of tools and material to the site shall be completed by 8:00 am.
3. Weekend and Overtime Hours: Shall be as approved by the Owner and Architect. This is not to limit the hours the contractor can perform work, but to only allow the Owner and Architect to have personnel available (in person or by phone) for questions or other issues.
4. Early Morning or Evening Hours: Shall be as regulated by authorities having jurisdiction for restrictions on noisy work.

C. Parking:

1. There is no on-site parking available. All contractor and sub-contractor employees shall park on surrounding streets with permits or make arrangements for off site parking.

D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Owner not less than four days in advance of proposed utility interruptions.
2. Obtain Owner's written permission before proceeding with utility interruptions.

E. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner or others.

1. Notify Owner not less than four days in advance of proposed disruptive operations.
2. Obtain Owner's written permission before proceeding with disruptive operations.

F. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.

G. Controlled Substances: Use of tobacco or controlled substances on Project site is not permitted.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.10 CODES, RULES AND REGULATIONS

A. All work is to be in accordance with the latest requirements of:

1. Federal, State and Municipal Laws
2. Rhode Island Building and Fire Codes
3. National Plumbing Code
4. National Electric Code
5. Any prevailing rules, regulations pertaining to adequate protection and/or guarding of any moving parts or otherwise hazardous locations.

1.11 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

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

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

1.12 JOB SAFETY AND ACCIDENT PREVENTION

A. All construction work on this project must be performed in compliance with the Occupational Safety and Health Act of 1970 or with local or State occupational safety and health regulations enforced by an agency of the locality or State under a plan approved by the U.S. Department of Labor Occupational Safety and Health Administration (OSHA)

B. All contractors and subcontractors shall comply with requirements of the Occupational Safety and Health Act of 1970 or revisions thereto, which are applicable during the term of this contract and hold the Owner and Architect and/or their agents harmless from any claim or loss that may result from violations of or claims under this act.

C. See the General Conditions for further requirements.

1.13 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:

a. Application for Payment forms with continuation sheets.
b. Submittal schedule.
c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect at earliest possible date but no later than 15 days from date of notice to proceed.
3. Sub-schedules for Phased Work: Where the Work is separated into phases requiring separately phased payments; provide sub-schedules showing values coordinated with each phase of payment.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

a. Project name and location.
b. Name of Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.

a. Include separate line items labor and materials.

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

4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
5. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
7. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

    a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.

8. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.14 MISCELLANEOUS PROVISIONS

A. SUPERINTENDENCE OF SUBCONTRACTORS

1. The contractor must supervise subcontractors in accordance with the provisions of General Conditions. A project superintendent shall be on site whenever any work is being performed. Superintendent shall be an employee of the Contractor.
2. Project superintendent shall be acceptable to the Owner and Architect. Submit superintendent’s qualifications for review and acceptance within two days of the notice of award or notice to proceed whichever is first.

B. COORDINATION

1. Prior to commencement of subcontract work, a designated representative of each subcontractor shall meet with project superintendent, Owner and Architect at the site to discuss requirements and scope of Work.
2. The Contractor and all subcontractors will be required to attend a preconstruction conference at a date and time set by the Owner.

C. BEHAVIOR OF PERSONNEL

1. If in the opinion of the Owner or Architect, any employee of the Contractor or his subcontractors is physically or mentally unfit for work or exhibits behavior incompatible with work site environment, said employee may be required to leave property and may be refused re-admittance.

D. SUBSTITUTIONS

1. In all cases where a proprietary designation is used in connection with materials or articles to be furnished under this contract and the phrase "or equal" is not used, the Contractor shall furnish the specified item, unless a written request for a substitute has been submitted by the Contractor and review by the Architect to his satisfaction.

2. See Section 01 60 00 for additional requirements and Contractor responsibility relating to substitutions. Specifically, subparagraphs relating to speculative substitutions and additional liabilities.

E. DRAWINGS AND SPECIFICATIONS

1. All work drawn on Plans and not specified or all work specified and not drawn are part of Contract Work required to be done and are to be executed as fully as if described in both of these ways. Only work specifically noted in the following manner shall be considered as not being in the contract:
2. ".....by Owner".
3. ".....NIC (Not In Contract)".
4. If, after examination of Contract Drawings and Specifications, or after a visit to the premises, any discrepancies, omissions, ambiguities, or conflicts are found in or amount contract documents or there is doubt as to their meaning, Architect is to be notified at the earliest possible date. Where information sought is not clearly indicated or specified, the Architect will issue addendum to the Contractor clarifying conditions, which addendum will become part of the Contract Documents. Neither the Owner nor the Architect will be responsible for any oral instructions.
5. If there are two ways and/or instruction in drawings and/or specifications, it shall be assumed that the Contractor has based his base bid price on the most expensive way.
6. If duplication is shown on drawings and/or specifications of work by more than one trade, Architect shall determine which trade shall do work and rebate shall be due from the other trades to Owner.
7. Drawings DO NOT include any necessary components for construction safety.
8. In all work shown on Drawings, figured dimensions are to be followed in all cases, though they may differ from scaled measurements. Before beginning the work, Contractor is to check through and verify all dimensions/elevations and call to the attention of the Architect any apparent or manifest discrepancy.
9. Contractor shall verify all dimensions with existing and actual field conditions, prior to start of any work.
10. All work and materials shown on drawings shall be interpreted by the Contractor as being new work and materials to be furnished and installed unless are specifically indicated as existing to remain.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Contingency allowances.

C. Related Requirements:

1. Divisions 02 through 26 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

1. If proposals are requested by the Architect the contractor shall provide a minimum of 3 proposals for each product or system.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

1.8 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.9 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

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

2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Contingency Allowance: Include a contingency allowance of $10,000.00 for use according to Owner's written instructions.

1. This allowance includes material cost, receiving, handling, and installation, and Contractor overhead and profit.

END OF SECTION 01 21 00

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. ADD Alternate No. ONE

1. All work associated with providing and installing Chilled Water Pump No. 3 and associated piping / trim as well as extending the existing concrete pad to accommodate Chilled Water Pump No. 3. Refer to drawing M-200, M-300, and M-800.

END OF SECTION 01 23 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Requests for Information (RFIs).
3. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
2. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.
3. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.3 DEFINITIONS

A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail

addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, which depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Frivolous RFIs: RFIs generated by the contractor because of his failure to adequately study and compare the Contract Documents, or coordinating their own work, shall be considered frivolous. The contractor shall pay all A/E and owner costs associated with responding to these RFIs.

C. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.

5. Name of Architect
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

D. RFI Forms: AIA Document G716 or another form that in the sole opinion of the Architect is acceptable.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

E. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days plus seven days for consultants for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Frivolous, iIncomplete or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 5 days of receipt of the RFI response.

F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.

G. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within five days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.7 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.

1. Conduct the conference to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing and long-lead items.
d. Designation of key personnel and their duties.
e. Lines of communications.
f. Procedures for processing field decisions and Change Orders.
g. Procedures for RFIs.
h. Procedures for testing and inspecting.
i. Procedures for processing Applications for Payment.
j. Distribution of the Contract Documents.
k. Submittal procedures.
l. Preparation of record documents.
m. Use of the premises and existing building.
n. Work restrictions.
o. Working hours.
p. Owner's occupancy requirements.
q. Responsibility for temporary facilities and controls.
r. Procedures for moisture and mold control.
s. Procedures for disruptions and shutdowns.
t. Construction waste management and recycling.
u. Parking availability.
v. Office, work, and storage areas.
w. Equipment deliveries and priorities.

x. First aid.
y. Security.
z. Progress cleaning.

4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 30 days prior to the scheduled date of Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Preparation of record documents.
b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
c. Submittal of written warranties.
d. Requirements for preparing operations and maintenance data.
e. Requirements for delivery of material samples, attic stock, and spare parts.
f. Requirements for demonstration and training.
g. Preparation of Contractor's punch list.
h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
i. Submittal procedures.
j. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

D. Progress Meetings: Conduct progress meetings at weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

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

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Progress cleaning.
10) Quality and work standards.
11) Status of correction of deficient items.
12) Field observations.
13) Status of RFIs.
14) Status of proposal requests.
15) Pending changes.
16) Status of Change Orders.
17) Pending claims and disputes.
18) Documentation of information for payment requests.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

1.8 Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's construction schedule.
2. Construction schedule updating reports.
3. Daily construction reports.
4. Site condition reports.
5. Special reports.

B. Related Requirements:

1. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
2. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Event: The starting or ending point of an activity.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. PDF electronic file.

B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

C. Construction Schedule Updating Reports: Submit with preliminary (pencil copy) Applications for Payment.

D. Daily Construction Reports: Submit at weekly intervals.

E. Site Condition Reports: Submit at time of discovery of differing conditions.

F. Special Reports: Submit at time of unusual event.

1.5 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.

3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 01 Section "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
6. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with site use limitations.
    b. Limitations of continued occupancies of adjacent buildings.
    c. Uninterruptible services.
    d. Use of premises restrictions.
    e. Environmental control.

7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

    a. Subcontract awards.
    b. Submittals.
    c. Purchases.
    d. Mockups.
    e. Fabrication.
    f. Sample testing.
    g. Deliveries.
    h. Installation.
    i. Tests and inspections.
    j. Adjusting.
    k. Curing.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, final completion, and the following interim milestones:

1. Temporary enclosure and space conditioning.
2. North parking lot access roadway completion.

E. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance and date by which recovery will be accomplished.

F. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

1. Use Microsoft Project for Windows XP operating system.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice of Award. Base schedule on the startup construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require two months or longer to complete, indicate an estimated completion percentage in 5 percent increments within time bar.

2.3 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (see special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within two day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:

1. Division 01 Section "Project Management and Coordination" for submitting Contractor's construction schedule.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.

B. Architect will not process or review submittals that have not been reviewed by the Contractor or that do not have the Contractor’s review / approval stamp on them.

C. Submittals received by Architect after 12:00 p.m. will be considered as received the following working day.

D. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

E. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

    a. Allow additional 5 days for review of each submittal where it is necessary for review by Architect or Owner consultant.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.

    a. Allow additional 5 days for review of each submittal where it is necessary for review by Architect or Owner consultant.

F. Paper Submittals: Place a permanent label or title block on each submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Construction Manager.
    e. Name of Contractor.
    f. Name of subcontractor.
    g. Name of supplier.
    h. Name of manufacturer.
    i. Submittal number or other unique identifier, including revision identifier.

        1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alph numereic suffix (e.g., 061000.01R1).

    j. Number and title of appropriate Specification Section.
    k. Drawing number and detail references, as appropriate.
    l. Location(s) where product is to be installed, as appropriate.
    m. Other necessary identification.

4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.

    a. Transmittal Form for Paper Submittals: Use AIA Document G810.
    b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:

        1) Project name.
        2) Date.
        3) Destination (To:).
        4) Source (From:).

5) Name and address of Architect.
6) Name of Construction Manager.
7) Name of Contractor.
8) Name of firm or entity that prepared submittal.
9) Names of subcontractor, manufacturer, and supplier.
10) Category and type of submittal.
11) Submittal purpose and description.
12) Specification Section number and title.
13) Specification paragraph number or drawing designation and generic name for each of multiple items.
14) Drawing number and detail references, as appropriate.
15) Indication of full or partial submittal.
16) Transmittal number, numbered consecutively.
17) Submittal and transmittal distribution record.
18) Remarks.
19) Signature of transmitter.

G. Options: Identify options requiring selection by Architect.

H. Deviations: Identify deviations from the Contract Documents on submittals.

I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements:

1. Action Submittals: Submit five paper copies of each submittal unless otherwise indicated. Architect will return two copies.
2. Informational Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will not return copies.
3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

a. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. 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 published 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 catalog cuts.
    b. Manufacturer's product specifications.
    c. Standard color charts.
    d. Statement of compliance with specified referenced standards.
    e. Testing by recognized testing agency.
    f. Application of testing agency labels and seals.
    g. Notation of coordination requirements.
    h. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams showing factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.
    d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:

    a. Five paper copies of Product Data unless otherwise indicated. Architect will return two copies.

C. 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.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Identification of products.
    b. Schedules.
    c. Compliance with specified standards.
    d. Notation of coordination requirements.
    e. Notation of dimensions established by field measurement.
    f. Relationship and attachment to adjoining construction clearly indicated.
    g. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
3. Submit Shop Drawings in the following format:

    a. Five opaque copies of each submittal. Architect will retain three copies; remainder will be returned.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of applicable Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit three sets of Samples. Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.

        1) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Submit product schedule in the following format:

    a. Four paper copies of product schedule or list unless otherwise indicated. Architect will return two copies.

F. Coordination Drawings Submittals: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

G. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

H. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Section "Summary."

I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."

J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."

K. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

U. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed

before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

X. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file and five paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

1. Contractor shall clearly identify ”any” and “all” deviations from the contract documents.
2. Contractor shall clearly identify items which need clarification with other trades than the trade submitting the submittal.
3. Contractor shall cleary identify “any” and “all” modifications to the contract documents required by the submittal.

B. Resubmittals shall have “all” changes, modifications , etc. clearly identified. Failure to identify changes, modifications, etc. shall be justification for returning the submittal without A/E review.

C. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Section "Closeout Procedures."

D. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

E. Failure of Contractor to properly review or stamp submittal shall be justification for returning the submittal without A/E review.

F. Contractor shall submit documents required by authorities having jurisdiction and obtain their approvals prior to submission to the Architect.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

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

C. The contractor is responsible for the overall quality of all its own work and the work performed by the subcontractors working under this contract. The quality of any part of the work installed must not be less than that required by the contract documents. If the Architect or Owner determines that the quality of work does not conform to the applicable specifications and drawings, the contractor will be advised in writing of the areas of nonconformance and within 24 hours the contractor must correct the deficiencies and advise the Architect and Owner in writing of the corrective action taken.

D. Related Sections include the following:

1. Divisions 23 through 26 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction. If individual specification sections require a higher minimum experience requirement that requirement shall supersede this subparagraph.

1.4 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or

maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

A. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.

1. Indicate manufacturer and model number of individual components.
2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data : For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by applicable building code, authorities having jurisdiction or the contract documents submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

F. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.

9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

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

1.7 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and regulations governing the Work.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.8 QUALITY CONTROL

A. Special Tests and Inspections: Owner will engage a qualified testing agency and special inspector to conduct special tests and inspections per the requirements of Chapter 17 of the Rhode Island State Building Codeas the responsibility of the Owner as indicated in the Statement of Special Inspections attached to this Section and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.

B. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.

C. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

    a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

1. All costs associated with retesting shall be the responsibility of the Contractor.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with Owner’s special inspector, testing agency and other agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.

6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

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

1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
2. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

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

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; comparable products and substitutions.

B. Related Requirements:

1. Division 01 for applicable industry standards for products specified.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, which is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

C. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use CSI Form 13.1A or another form that is acceptable to the Architect.

2. Form shall be sent to Architect in both hardcopy and electronic file form so that Architect may respond back to Contractor electronically.
3. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on

manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

k. Cost information, including a proposal of change, if any, in the Contract Sum.

l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

4. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.

b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.

4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See Divisions 02 through 33 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

1.8 SUBSTITUTIONS

A. Limitations on substitutions:

1. During Bidding period, Instructions to Bidders govern times for submitting requests for substitutions under requirements specified in this Section.
2. Substitutions will not be considered when indicated on shop drawings or product data submittals without separate formal request, when requested directly by subcontractor or supplier, or when acceptance will require substantial revision of Contract Documents.
3. Substitute products shall not be ordered or installed without written acceptance.
4. Only one request for substitution for each product will be considered. When substitution is not accepted, provide specified product.
5. Architect has sole right of determination of acceptability of substitutions.
6. A contractor or subcontractor who carries the cost of a substitute in his bid without prior review by the Architect, does so at his own risk. The Owner is no way obligated to review nor allow that a speculative substitution be furnished.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:

    a. Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.

4. Manufacturers:

    a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.

5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

2.3 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Requested substitution provides sustainable design characteristics that specified product provided.
c. Substitution request is fully documented and properly submitted.
d. Requested substitution will not adversely affect Contractor's construction schedule.
e. Requested substitution has received necessary approvals of authorities having jurisdiction.
f. Requested substitution is compatible with other portions of the Work.
g. Requested substitution has been coordinated with other portions of the Work.
h. Requested substitution provides specified warranty.

i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received within 30 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Requested substitution provides sustainable design characteristics that specified product provided.
e. Substitution request is fully documented and properly submitted.
f. Requested substitution will not adversely affect Contractor's construction schedule.
g. Requested substitution has received necessary approvals of authorities having jurisdiction.
h. Requested substitution is compatible with other portions of the Work.
i. Requested substitution has been coordinated with other portions of the Work.
j. Requested substitution provides specified warranty.
k. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

2.4 MANUFACTURER'S INSTRUCTIONS

A. When contract documents require installation of work to comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to the Owner's Representative. Maintain one copy of the instructions at the job site until project completion.

B. Should project conditions, drawings or specification requirements conflict with manufacturer's instructions the Contractor shall advise the Architect for further instructions, prior to commencement of the work.

C. Perform all work in accordance with manufacturer's instructions. Do not omit any preparatory step or installation procedure. If there are any conflicts with the contract documents notify the Architect prior to proceeding with the work.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

B. Related Requirements:

1. Division 01 Section "Summary" for limits on use of Project site.
2. Division 01 Section "Submittal Procedures" for submitting surveys.
3. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor and professional engineer.

B. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

D. Certified Surveys: Submit two copies signed by land surveyor.

E. Final Property Survey: Submit 5 copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to [local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements:

1. Verify space requirements and dimensions of items shown diagrammatically on Drawings.

2. Verify required finished ceiling height requirements prior to fabrication of HVAC and fire protection system piping or ductwork.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
4. Maintain minimum headroom clearance as indicated or of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces, whichever is greater.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Temporary Support: Provide temporary support of work to be cut.

C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Proceed with patching after construction operations requiring cutting are complete.

F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space.

Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

a. Use containers intended for holding waste materials of type to be stored.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Division 01 Sections.

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 01 73 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from site preparation demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.4 PERFORMANCE REQUIREMENTS

A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Construction Waste:

a. Plaster.
b. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

1) Paper.
2) Cardboard.
3) Boxes.
4) Plastic sheet and film.
5) Polystyrene packaging.
6) Wood crates.
7) Plastic pails.

1.5 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 7 days of date established for the Notice of Award.

1.6 INFORMATIONAL SUBMITTALS

A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste and Form CWM-8 for demolition waste. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons (tonnes).
4. Quantity of waste salvaged, both estimated and actual in tons (tonnes).
5. Quantity of waste recycled, both estimated and actual in tons (tonnes).
6. Total quantity of waste recovered (salvaged plus recycled) in tons (tonnes).
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.7 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review

methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of site-perparation and construction waste generated by the Work. Use Form CWM-1 for construction waste and Form CWM-2 for site preparation waste. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use Form CWM-3 for construction waste and Form CWM-4 for site preparation waste. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
2. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
3. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
4. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
5. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Use Form CWM-5 for construction waste and Form CWM-6 for site preparation waste. Include the following:

1. Total quantity of waste.
2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
6. Savings in hauling and tipping fees by donating materials.

7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Include cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with operation, termination, and removal requirements in Division 01 Section "Temporary Facilities and Controls."

B. Waste Management Coordinator: This can be the contractor's project manager, superintendent or other qualified individual acceptable to the architect. Waste management coordinator shall be responsible for implementing, monitoring, and reporting status of waste management work plan.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Sale and Donation: Not permitted on Project site.

3.3 RECYCLING WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Contractor's Option: As this construction site is very limited in area the use of c co-mingled collection system with off site separation is acceptable.
2. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

    a. Inspect containers and bins for contamination and remove contaminated materials if found.

3. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
4. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
5. Store components off the ground and protect from the weather.
6. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 01 74 19

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Division 01 Section "Execution" for progress cleaning of Project site.
2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
4. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
5. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

D. Certificate Of Occupancy from the authorities having jurisdiction.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

B. Submittals Prior to Substantial Completion: Complete the following a minimum of 21 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
3. Submit closeout submittals specified in individual Divisions 02 through 33 Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Submit maintenance material submittals specified in individual Divisions 02 through 33 Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturer's name and model number where applicable.

    a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Architect's signature for receipt of submittals.

5. Submit test/adjust/balance records.
6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

C. Procedures Prior to Substantial Completion: Complete the following a minimum of 21 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.

1. Advise Owner of pending insurance changeover requirements.
2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
3. Complete startup and testing of systems and equipment.
4. Perform preventive maintenance on equipment used prior to Substantial Completion.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
6. Advise Owner of changeover in heat and other utilities.
7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
9. Complete final cleaning requirements, including touchup painting.

10. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 21 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 14 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

a. Project name.

b. Date.
c. Name of Architect.
d. Name of Contractor.
e. Page number.

4. Submit list of incomplete items in the following format:

a. MS Excel electronic file. Architect will return annotated file.
b. PDF electronic file. This file is for record purposes.

1.9 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.

B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.10 RE-INSPECTION FEES

A. Should Architect perform re-inspections due to failure of the work to comply with the claims or status of completion made by the Contractor:

1. Owner will compensate the Architect for such additional services.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

a. Remove tools, construction equipment, machinery, and surplus material from Project site.
b. Clean exposed interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances.
c. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
d. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
e. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
f. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
g. Leave Project clean and ready for occupancy.

C. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

    a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Requirements:

1. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
2. Divisions 02 through 26 Sections for specific requirements for project record documents of the Work in those Sections.

1.2 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of record Drawings as follows:

a. Initial Submittal:

1) Submit PDF electronic files of scanned record prints and one set of file prints.
2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.

b. Final Submittal:

1) Submit PDF electronic files of scanned record prints and two set(s) of prints.
2) Print each drawing, whether or not changes and additional information were recorded.

B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one paper copy of each submittal.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Record data as soon as possible after obtaining it.
    c. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Format: Annotated PDF electronic file with comment function enabled.
3. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect.
    e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.

B. Format: Submit record Specifications as annotated PDF electronic file.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.

B. Format: Submit record Product Data as annotated PDF electronic file.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 78 39

TABLE OF CONTENTS

1.0 GENERAL

1.1 GENERAL CONDITIONS

A. Section includes general mechanical requirements for work specified in all other sections of Division 15, the drawings and schedules.

B. Subcontractor, unless otherwise qualified, shall mean the installer of the heating, ventilating and air conditioning work.

C. The work covered by this specification consists of furnishing all materials, labor, equipment and appurtenances to perform, and leave in satisfactory operating condition, all heating, ventilating, air conditioning work, complete, including all tests and adjustments, in strict accordance with the Specifications and the applicable drawings. Completely coordinate work of this section with work of other trades and provide a complete and fully functional installation.

D. Give notices, file plans, obtain permits and licenses, pay fees and charges, and obtain necessary approvals from authorities that have jurisdiction as required to perform work in accordance with all legal requirements of the contract documents.

E. Examine the site and all drawings before proceeding with the layout and installation of this work. Arrange the work essentially as shown, exact layout to be made on the job to suit actual conditions. Confer and cooperate with other trades on the job so all work will be installed in proper relationship. Precise location of parts to coordinate with other work is the responsibility of this subcontractor.

F. As used in these Sections, "provide" means "furnish and install." "Furnish" means to purchase and deliver to the project site complete with every necessary appurtenance and support," and "install" means "to unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project."

1.2 SCOPE OF WORK

A. HVAC work, including but not limited to:

1. Hoisting, rigging, and crane rental as required to complete the HVAC work.

2. Sleeves, inserts, supports, hangers and vibration isolation equipment. This includes all structural steel hangers, pipe racks and accessories to fully carry all piping, ductwork and equipment.

3. Demolition of HVAC related equipment, piping, ductwork, etc. as described in the contract drawings and specifications.

4. Provision and installation of all new HVAC related equipment as described in the contract drawings and specifications.

5. Provision and installation of all new piping, valves, hangers, supports, insulation, and appurtenances as indicated on the contract documents and specified in "HVAC Piping."

6. The Mechanical Contractor shall provide the labor to install wells, threadolets, valves, instrumentation, etc. required for the installation of the ATC control devices. The Mechanical Contractor shall closely coordinate his work with the ATC Subcontractor hired by this Contractor.

7. Provisions for the cleaning, start-up and testing of all HVAC systems.

8. Provisions of shop drawings, equipment submittals and as-built drawings.

9. Provision of installation, operation, and maintenance manuals, and startup instructions.

10. All aerial lifts and scaffolding as required for the new work.

11. Provisions for tags and identification of HVAC systems.

12. Chemical treatment, pipe testing and cleaning, as indicated in “HVAC Water Treatment”.

13. The mechanical contractor shall be responsible for all concrete core drilling and saw cutting required to install the piping, equipment, etc. as indicated in the contract drawings and specifications.

14. This contractor shall carry time for field support, start-up and testing personnel and provisions of paperwork as needed to satisfy the commissioning agent requirements.

15. The Mechanical Contractor shall drain, flush and clean the all newly installed piping. All existing strainers to remain shall have the screens removed and cleaned. The Mechanical Contractor shall hire a Water Treatment company to perform flushing, cleaning and install a chemical treatment system in place as specified in “HVAC Water Treatment.”

16. TAB – Air & Water Balancing. Refer to “HVAC Testing, Adjusting and Balancing.”

1.3 CONTRACT DOCUMENTS

A. Listing of Drawings does not limit responsibility of determining full extent of work required by these Contract Documents. Refer to Architectural, HVAC, Plumbing, Fire Protection, Electrical, Structural, Site Utility and all other Drawings and Sections that indicate types of construction in which work shall be installed and work of other trades with which work of this Section must be coordinated.

B. Drawings are diagrammatic. They are not intended to be absolutely precise; they are not intended to specify or to show every offset, fitting, and component. The purpose of the drawings is to indicate a systems concept, the main components of the systems, and the approximate geometrical relationships. Based on the systems concept, the main components, and the approximate geometrical relationships, the contractor shall provide all other components and materials necessary to make the systems fully complete and operational without extra charge to the Owner.

C. Where drawings and specifications conflict or are unclear, advise Engineer in writing before proceeding with work.

D. Where drawings and specifications do not coincide with manufacturer's recommendations or with applicable codes and standards, alert Engineer in writing before installation.

E. Certain details indicated on the Drawings are general in nature and specific labeled detail references to each and every occurrence of use are not indicated; however, such details by their titles shall be applicable to every occurrence on the Drawings.

F. The Engineer reserves the right to make reasonable modifications to the arrangement of outlets, apparatus and equipment up to the time of roughing piping and ducts without incurring extra cost to the Owner.

G. Drawings and Specifications form complementary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both. Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for a sound, secure, and complete installation.

H. Work shall be performed as described in the Specifications except where specific deviations are indicated and/or noted on the Drawings.

I. Where specific conflicts occur between the Specifications and the Drawings, the Specifications shall take precedence.

J. All measurements and dimensions indicated on the contract documents shall be field verified before installation. Notify Engineer of any discrepancies that affect the installation before proceeding.

1.4 CODES AND STANDARDS

A. The latest published issue of Standards or Recommendations of the following listed Societies, Associations or Institutes in effect three months prior to the date of this contract are part of this Specification. These shall be considered as minimum requirements. Specific requirements of this Specification and/or Drawings shall have precedence. In case of conflict between published requirements, the Owner's Representative or Engineer shall determine which is to be followed.

B. Where standards or codes are mentioned in these specifications, the latest edition of the revision shall be followed. Where provisions of the contract documents conflict with any standards, codes, laws, rules or regulations, the latter shall govern. Where the contract requirements are in excess of applicable standards, codes, law, rules or regulations the former shall govern, unless otherwise directed. Extra payment will not be allowed for work or changes required by local code or enforcement authorities.

C. Prior to commencement of work, notify applicable authorities as required and submit all of the required notifications for construction, operation and/or demolition.

D. Abbreviation and the title of national, state and industry standards, technical societies, associations and institutes and other organizations used throughout this division lists as follows:

(Abbreviation - Title of Organization)

AABC Associated Air Balance Council

ACGIH American Conference of Governmental Industrial Hygienists

ADC Air Diffusion Council

AMCA Air Moving and Conditioning Association

ANSI American National Standards Institute

ARI Air-Conditioning and Refrigeration Institute

ASHRAE American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

ASME American Society for Mechanical Engineers

ASTM American Society for Testing and Materials

FM Associated Factory Mutual Fire Insurance Companies

IBC 2012 International Building Code with R.I. addendums

IEC 2012 International Energy Code with R.I. addendums

IFC	2012 International Fire Code with R.I. addendums
IMC	2012 International Mechanical Code with R.I. addendums
MCAA	Mechanical Contractors Association of America
MSBC	Massachusetts State Building Code
MSS	Manufacturer's Standardization Society of the Valve and Fittings Industry, Inc.
NAPHCC	National Association of Plumbing, Heating, Cooling Contractors
NBS	National Bureau of Standards
NEBB	National Environmental Balancing Bureau
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFC	National Fire Code
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Association
SMACNA	Sheet Metal and Air Conditioning Contractors, National Association, Inc.
TIMA	Thermal Insulation Manufacturers Association
UL	Underwriters' Laboratories, Inc.
UMC	Uniform Mechanical Code

E. Perform work strictly as required by rules, regulations, standards, codes, ordinances, and laws of local, state, and Federal governments, and other authorities that have legal jurisdiction over the site.

F. Equipment and installation must comply with requirements set forth by Owner's Insurance Underwriter.

G. Equipment shall bear Underwriters' Laboratories labels where applicable.

H. Installation shall comply with all local and state plumbing regulations.

I. All materials furnished and all work installed shall comply with the rules and recommendations of the National Fire Protection Association with all requirements of local

utility companies, with the recommendations of the Fire Insurance Rating Organization having jurisdiction and with the requirements of the State of Rhode Island and the City/Town for which the project resides.

J. Any materials or workmanship called for in the above referenced requirements not specified or shown on the drawings shall be furnished and installed by the subcontractors as though the same had been specifically indicated or mentioned. Any work installed in conflict with these requirements shall become the sole responsibility of the subcontractor, who shall assume the expense to rectify the installation to the Engineer's satisfaction.

K. The subcontractor shall notify the Engineer of any deviations from the above referenced requirements pertaining to work indicated or specified before the installation of this work is affected.

1.5 COORDINATION WITH THE BUILDING TRADES

A. Structural members and building openings for ducts, piping, etc., for use by the mechanical subcontractor shown on the plans are the coordination responsibility of these subcontractors. Any changes in the above requirements after letting and accepting the respective contract will be paid for by the mechanical subcontractor. Any additional costs incurred due to the information not being provided on time or in error will be paid for by the responsible subcontractor.

1.6 GUARANTEE

A. Guarantee the Work of this Section in writing for one year following the date of System Acceptance by Owner and Engineer of Record. The guarantee shall repair or replace defective materials, equipment, workmanship and installation that develop within this period, promptly and to Owner's satisfaction and correct damage caused in making necessary repairs and replacements under guarantee within Contract Price.

B. In addition to guarantee requirements of Division 1 and Subparagraph A above, obtain written equipment and material warranties offered in manufacturer's published data without exclusion or limitation, in Owner's name.

C. Submit copies of equipment and material warranties to Owner before final payment.

D. At end of guarantee period, transfer manufacturers' equipment and material warranties still in force to Owner.

E. This Paragraph shall not be interpreted to limit Owner's rights under applicable codes and laws and under this Contract.

F. Use of systems provided under this section for temporary services and facilities shall not constitute Final Acceptance of work nor beneficial use by Owner, and shall not institute guarantee period.

1.7 SHOP DRAWINGS AND SUBMITTALS

A. General

1. Shop Drawings are information prepared by the subcontractor to illustrate portions of the work in more detail than shown in the Contract Documents.

   a. Accompany submittal with transmittal letter containing project name, subcontractor's name, number of samples or drawings, titles, and other pertinent data. Outline deviations, if any, in submittals from requirements of Contract Documents.

2. Each individual submittal item shall be marked to show the specifications section and paragraph number which pertains to the item.

3. Shop drawings shall include printed catalog specifications and printed capacity data to enable confirmation of capacities and specifications which may be shown on certified prints. Where catalogs or data submitted are applicable to several different sizes or types of similar equipment, the vendor shall clearly indicate which piece of equipment or material is to be provided under this contract. If the submittal is not properly marked it will be returned NOT APPROVED.

4. If the subcontractor fails to submit properly marked, complete and prudently timed, shop drawings and thus, causing delays in re-submittal or project schedules, it is the subcontractor's responsibility to do whatever is necessary to meet schedules at no additional cost to the Owner.

5. Shop drawings, catalog specification data and capacity ratings of the following items shall be submitted to the Engineer for approval prior to purchase or installation of any work:

   a. All equipment scheduled on the drawings. Submittals shall contain, as a minimum, all performance data as listed on schedules so that the Engineer can easily compare manufacturer's data. Submittals not meeting these criteria shall be disapproved.

   b. As specified in other Division 15 Sections.

6. Engineer's review of shop drawings is for general conformance with the design concept and contract documents. Marking or comments shall not be construed as relieving the subcontractor from compliance with the project plans and specifications, nor departures there from. The subcontractor remains responsible for details and accuracy.

7. This subcontractor is responsible for the dimensions and arrangement of equipment as it is applied to this project. Any adaptation, modification or addition is the responsibility of and be paid for by this subcontractor and shall be approved by the Engineer before execution. Any openings in the building required for the execution of this contract is the responsibility of this subcontractor to coordinate. The number of copies of shop drawings shall be as per the General Conditions of the Specifications.

B. Submittal Procedures and Format

1. Review submittal packages for compliance with Contract Documents and then submit to Engineer for review. Submit transparency and two blue- or black line reproductions of each Shop Drawing larger than 8-1/2 x 11. Submit six sets of each smaller shop drawing. After review, transparency original of each large Shop Drawing and four sets of each small shop drawing will be returned with reviewer's marks.

2. Shop Drawings showing layouts of systems shall contain sufficient plans, elevations, sections, details and schematics to describe work clearly. They shall be 1/4" = 1'-0" scale unless specified otherwise. Sheetmetal shop drawings shall be 1/4" =1'-0" and shall indicate work of other Sections where physical clearances are critical and where interferences are possible. Provide larger scale details as necessary. Sheet metal drawings shall show exposed ductwork, walls, partitions, diffusers, registers, grilles, dampers, sleeves and other aspects of construction as necessary for coordination.

3. Shop drawings showing manufacturer's product data shall contain detailed dimensional drawings, accurate and complete description of materials of construction, manufacturer's published performance characteristics and capacity ratings (performance data alone is not acceptable), electrical requirements and wiring diagrams. Drawings shall clearly indicate location (terminal block or wire number), voltage and function for all field terminations, and other information necessary to demonstrate compliance with all requirements of Contract Documents.

C. Acceptable Manufacturers

1. The Engineer's mechanical design for each product is based on the single manufacturer listed in the schedule or shown on the drawings. Alternate acceptable manufacturers are listed below the schedules on the contract documents. No other manufacturers will be acceptable. Alternate manufacturers shall meet the following:

   a. Meet all performance criteria listed in the schedules and outlined in the specification.

   b. Have identical operating characteristics to those called for in the specification.

   c. Fit within the available space it was designed for, including space for maintenance and component removal, with no modification to either the space or the product. Clearances to walls, ceilings and other equipment will be at least equal to those shown on the design drawings. The fact that a manufacturer's name appears as acceptable shall not be taken to mean that the Engineer has determined that the manufacturer’s products

will fit within the available space - this determination is solely the responsibility of the subcontractor.

d. For rooftop mounted equipment and for equipment mounted in areas where structural matters are a consideration, the products must have a weight no greater than the product listed in the schedules or specifications.

e. Products must adhere to all architectural considerations including but not limited to: being of the same color as the product scheduled or specified, fitting within architectural enclosures and details, and for diffusers, lighting and plumbing fixtures - being the same size and of the same physical appearance as scheduled or specified products.

D. Deviations

1. Concerning deviations other than substitutions, proposed deviations from Contract Documents shall be requested individually in writing whether deviations result from field conditions, standard shop practice, or other cause. Submit letter with transmittal of Shop Drawings which flags the deviation to the attention of the Engineer.

2. Approval of proposed deviations, if any, will be made at discretion of Engineer.

E. Schedule

1. Incorporate shop drawing review period into construction schedule so that work is not delayed. Subcontractor shall assume full responsibility for delays caused by not incorporating the following shop drawing review time requirements into his project schedule. Working days listed reference the time in the Engineer's office. It does not include transmittal or review time of subcontractor or Architect. Allow at least 5 working days, exclusive of transmittal time, for review each time shop drawing is submitted or resubmitted.

F. Responsibility

1. Intent of Submittal review is to check for capacity, rating, and certain construction features. Subcontractor shall ensure that work meets requirements of Contract Documents regarding information that pertains to fabrication processes or means, methods, techniques, sequences and procedures of construction; and for coordination of work of this and other Sections. Submittal review shall not diminish responsibility under this Contract for dimensional coordination, quantities, installation, wiring, supports and access for service, nor the shop drawing errors or deviations from requirements of Contract Documents. The Engineer's noting of some errors while overlooking others will not excuse the subcontractor from proceeding in error. Contract Documents requirements are not limited, waived nor superseded in any way by review.

2. INFORM SUBCONTRACTORS, MANUFACTURERS, SUPPLIERS, ETC. OF SCOPE AND LIMITED NATURE OF REVIEW PROCESS AND ENFORCE COMPLIANCE WITH CONTRACT DOCUMENTS.

G. Resubmission

1. Subcontractor shall make corrections and changes indicated for rejected submissions; resubmit in same manner specified above. This procedure shall be repeated until all corrections are made to the satisfaction of the Engineer and the Owner.

1.8 FEES AND PERMITS

A. Apply for, obtain and pay for all required permits and inspection certificates.

1.09 EQUIPMENT IDENTIFICATION

A. Equipment and component parts thereof shall bear manufacturer's nameplates, giving manufacturer's name, size, type model number or serial number, and electrical characteristics, to facilitate maintenance and replacements. Nameplates of distributors or subcontractors are not acceptable. Electrical equipment shall be UL listed as applicable.

B. All labels and tags shall conform to ANSI/ASME A13.1.

C. Identify all HVAC equipment including, air handling units, fans, heating devices, etc. with plastic tags. Plastic tags shall be laminated three-layer plastic with engraved black letters on light, contrasting background color. Tag size shall be 1-1/2” square or diameter minimum with 3/8" minimum high text.

D. Identify piping as indicated in specification 61562-15500 "HVAC Piping."

1.10 RECORD DRAWINGS

A. The Engineer will furnish the subcontractor one set of AutoCAD 2018 drawing files in AutoCAD 2018 or Revit 2018 format of the mechanical drawings as issued for this contract. Change these drawings to indicate accurately and neatly, any deviation in the actual installation from the Drawings as issued, including work installed as a modification or addition to the original design. Include actual location of existing utilities if they differ from design documents.

B. Record drawings shall show record condition of details, sections, riser diagrams, control changes and corrections to schedules. Schedules shall show actual manufacturer and make and model numbers of final equipment installation.

C. THE ENGINEER WILL NOT CERTIFY THE ACCURACY OF THE RECORD DRAWINGS - THIS IS THE SOLE RESPONSIBILITY OF THE SUBCONTRACTOR.

D. Each trade shall submit the record set for approval by the building department in a form acceptable to the department, when required by the jurisdiction. Such drawing format

size changes, and supplemental information required for the submittal is the requirement of the subcontractor.

1.11 INSTALLATION, OPERATION & MAINTENANCE MANUAL INSTRUCTIONS

A. Obtain at time of purchase of equipment, three copies of operation, installation and maintenance manuals for all items. Assemble literature in coordinated manuals with additional information describing combined operation of field assembled units, including as-built wiring diagrams. Manual shall contain names and addresses of manufacturers and local representatives who stock or furnish repair parts for items or equipment. Divide manuals into three sections or books as follows:

1. Directions for and sequence of operation of each item or mechanical system, e.g. pumps, fans, etc. Sequence shall list valves, switches, and other devices used to start, stop and control system. Detail procedure to be followed in case of malfunctions.

2. Detailed maintenance and troubleshooting manuals containing data furnished by manufacturer for complete maintenance. Include copy of an approved balancing report.

3. Lubrication instructions detailing type of lubricant, amount, and intervals recommended by manufacturer for each item of equipment. Include additional instructions necessary for implementation of first class lubrication program. Include approved summary of lubrication instructions in chart form, where appropriate.

4. Manufacturer’s literature describing each equipment item and containing final approved copies of shop drawings of each item listed.

5. Copy of each automatic control diagram, with respective sequences of operation, consisting of final approval shop drawings, corrected to “as-installed”.

6. Manufacturer’s installation instructions and detailed parts list for each major equipment item.

7. Complete list of spare parts as recommended by each equipment manufacturer for each item of equipment on the project.

8. 11x17 scale down set of the as-built documents.

B. Furnish three copies of manuals to Engineer for approval and distribution to Owner. Deliver manuals no less than 30 days prior to acceptance of equipment to permit Owner's personnel to become familiar with equipment and operation prior to acceptance.

C. Operating instructions: Upon completion of installation or when Owner accepts portions of building and equipment for operational use, instruct Owner's operating personnel in any or all parts of various systems. Instructions shall be performed by factory trained personnel. Owner shall determine which systems require additional instructions.

Duration of instructions shall take equipment through complete cycle of operation. Make adjustments under operating conditions.

1.12 PROTECTION OF EQUIPMENT, MATERIALS & PREMISES

A. Each subcontractor shall be responsible for his work and equipment until finally inspected, tested, and accepted. Carefully store materials and equipment which are not immediately installed after delivery to site. Close open ends of work with temporary covers or plug during construction to prevent entry of obstructing material.

B. Each separate subcontractor shall protect the work and material of other trades that might be damaged by his work or workmen and make good all damage thus caused.

C. All floors, walls, ceilings and furniture shall be properly protected from damage by this subcontractor during the installation via plywood and/or plastic covering. Relocation of furniture shall not be done without the approval from the Owner. Any damage caused by the installation shall be remedied by this sub-contractor at no additional cost to the owner.

1.13 INSTRUCTION TO OWNER'S PERSONNEL

A. After completion of work and tests, the subcontractor shall provide necessary skilled personnel to operate the entire installation for a total period of one 8-hour day. During the operating period the subcontractor shall fully instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

1.14 SELECTION AND ORDERING OF MATERIALS

A. General

1. Arrange for purchase and delivery of materials and equipment required in ample quantities and at proper time. Immediately notify the Architect/Engineer of any inability to obtain suitable delivery of any apparatus or materials required.

B. Products

1. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.

2. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

3. Provide interchangeable components of the same manufacturer, for similar components.

C. Transportation and Handling

1. Transport and handle products in accordance with manufacturer's instructions.

2. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

3. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

D. Storage and Protection

1. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight, climate controlled enclosures.

2. For exterior storage of products, place on sloped supports, above ground.

3. Provide off-site storage and protection when site does not permit on-site storage or protection.

4. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation.

5. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under specified conditions.

2.0 PRODUCTS

2.1 MATERIALS

A. All materials, except as otherwise specified, shall be new, of current production, first quality, and the best of each class specified.

B. Required materials not covered by the detailed specifications shall be of a suitable class, grade, and type and shall be subject to the approval of the Engineer. Where two or more units of the same class of equipment are required, these units shall be the products of a single manufacturer. All equipment and materials shall be installed and constructed to operate safely, as designed, without leakage, undue wear, noise, vibration or corrosion.

2.2 SLEEVES

A. Provide sleeves in locations where pipes or conduits pass through floors, walls, partitions, structural members and roof. Do not make openings which impair strength, function or esthetics of the work. Notify Construction Manager/Engineer prior to any cutting work. Coordinate responsibilities with structural. Refer to 39310-15500 “HVAC Piping” for additional information.

2.3 ACCESS PANELS

A. Do not place products requiring regular maintenance including valves, traps, controls, unions, dampers, coils, air distribution boxes, actuators, cleanouts at locations that will be inaccessible after construction is completed. Maintain accessibility for all components in systems.

B. Provide access doors complying with architectural specifications for items concealed above finished ceilings, behind finished walls or floors.

C. Unless specified in architectural specifications, provide access doors of following sizes: 12 x 12 inches for readily accessible equipment, 18 x 18 inches where partial body access is required and 24 x 24 inches where entire body access is required.

D. Locate access panels for walls, ceilings and floors at locations indicated on drawings or as required to permit access for adjustment, removal and replacement, and servicing of all concealed HVAC equipment.

E. All access panels shall be located in a workmanlike manner, generally in closets, storage rooms and other non-public areas, positioned so that the equipment can be easily reached, and the size shall be sufficient for this purpose (minimum 14" x 14"). When access panels are required in corridors, lobby or other habitable areas, they will be located as directed by the Engineer.

2.4 SUPPLEMENTARY STEEL, CHANNELS AND SUPPORTS

A. Furnish and install all supplementary steel and structural supports required for the proper installation, mounting and support of all equipment.

B. Supplementary steel and channels shall be firmly connected to building construction in a manner approved by the Engineer, as specified.

C. The type and size of the supporting steel shall be determined by the installer and shall be of sufficient strength and size to allow only a minimum deflection in conformance with the manufacturer's requirements.

D. All supplementary steel shall be installed in a neat and workmanlike manner parallel to the walls, floor and ceiling construction. All turns shall be made with 90 degree and 45 degree fittings, as required to suit the construction and installation conditions.

E. All supplementary steel supports and fitting shall be galvanized structural steel or galvanized roll formed steel as manufactured by Unistrut, Power-Strut, or approved equal.

3.0 EXECUTION

3.1 PREPARATION

A. Arrangements shall be made to have the openings, inserts, sleeves and such other incidentals set in place ahead of the construction work, where practical, to eliminate the need of cutting and patching. If cutting becomes necessary for installation of the work, it

shall be done under this Section. All holes shall be neatly patched and approved by the Engineer. All cutting shall be performed in a manner approved by the Engineer. All cutting shall be performed in a manner not to weaken the structural parts and in the manner and method which shall meet the approval of the Engineer and code.

3.2 WORKMANSHIP

A. All work shall be coordinated with the work to be performed or installed under other Sections of these Specifications.

B. All work shall be executed in a workmanlike manner by workmen skilled in this type of work and shall present a neat appearance when completed.

C. Where required to avoid interference with other work, to increase headroom, or to improve the appearance of duct runs, offsets shall be provided as required. All duct supports, structural members, hangers and other apparatus necessary to support firmly and substantially the various components of the systems shall be provided under this Section.

D. Nameplates, catalog numbers and rating identifications shall be securely attached to equipment with screws or rivets. Adhesives or cements will not be permitted.

E. This subcontractor shall be responsible for the protection of the work from injury and shall protect all apparatus with suitable enclosures.

3.3 ERECTION AND INSTALLATION

A. Installation and workmanship requirements are specified hereinafter.

B. This subcontractor shall be responsible for the furnishing and installing of all support steel, hangers, rods, clamps, etc., to provide adequate support of all mechanical equipment specified herein.

C. Provide all transportation, freight, loading, and unloading, and provide all labor necessary for erecting in place all material and equipment shown, specified or required for completion of the HVAC work.

D. The work shall be performed in a timely manner so as to cause no delay in job progress. Cooperate with the other phases of construction so that the work is installed in the most beneficial sequence for proper project completion.

E. Install all work so that all parts required are readily accessible for inspections, operation, maintenance, and repair. Minor deviations from the drawings may be made for this purpose, but changes of magnitude shall not be made without prior written approval of the Engineer.

3.4 CLEANING OF SYSTEMS AND PREMISES

A. Before the systems are tested and balanced, ducts and all air handling equipment shall be thoroughly cleaned so that no dirt, dust, or other foreign matter will be deposited in or carried through the systems.

B. At all times, keep the premises clear of undue accumulation of rubbish.

C. On completion of each day's work, remove all rubbish and debris resulting from this contract, and dispose of same. At any time should the Construction Manager/Owner be dissatisfied with the performance of clean-up responsibilities, he may elect, after proper notification, to undertake this operation and charge this subcontractor accordingly.

D. Air ducts shall be protected after fabrication and in shipment, prior to construction. Openings shall be suitably closed to prevent the admission of dust and construction debris. The protection shall be a minimum of 10 mil reinforced plastic and shall be removed only by the subcontractor installing the ductwork system.

E. The work of each section includes removing tools, providing daily clean-up of work area, scaffolding, surplus materials, barricades, temporary walks, debris and rubbish from the project promptly upon completion of that portion of the work. Leave the area of work clean and free of these items.

F. Disconnect, clean and whenever necessary, remove obstructions from any system and reconnect system. Repair or replace work damaged in the course of removing obstructions, at no cost to Owner.

G. Protect all finished work against physical damage during the course of construction and until completion and acceptance by Owner.

H. During construction, cap all lines and equipment so as to prevent the entrance of debris and dirt. Protect against moisture, plaster, cement, paint and other work by covering the polyethylene sheets.

3.5 FIRESTOPPING

A. Firestopping: unused slots, sleeves and other penetrations in floors, walls or other general construction shall be closed and sealed with an approved firestopping material.

1. Firestopping material shall be UL listed and tested silicone elastomer specifically formulated for use in horizontal and vertical applications. The material shall possess intumescent characteristics; upon exposure to heat above 250° F shall expand to not less than five times its original volume to form a fireproof envelope UL rated for 2- and 3-hour protection, when applied in accordance with the manufacturer's recommendation.

2. Floor slots and openings shall be closed with 16 gauge galvanized steel sheet supported on 1-inch by 1-inch by 1/8-inch structural angle drilled or supported with powder-driven studs into the building structure. Firestop with a layer of silicone elastomer not less than 1-inch thick which completely fills the opening.

The top surface of the silicone elastomer shall be approximately 1-inch below the finished floor slab.

3. Openings in walls shall be closed with 16 gauge galvanized steel sheet securely attached at the midpoint of the wall thickness and firestopped on both sides of the steel sheet with not less than 1/8-inch thick layer of non-sagging silicone elastomer to fully cover the opening.

4. Single or multiple pipes passing through walls and floors shall have the annular space between pipes or between pipes and structure filled with silicone elastomer to provide a 3-hour rated firestop for floors and walls.

B. Pipe and Ducts: The annulus between exposed pipe and ductwork and walls or floors in finished spaces shall be filled, sealed, and painted to match adjacent surfaces.

C. Future Slots: Identify unused sleeves and slots for future use by permanently anchored brass nameplates identifying size and purpose of the covered slot.

3.6 START UP AND TESTING

A. General

1. Completion of start up and commissioning is a prerequisite for substantial completion.

2. Operate and maintain systems and equipment until final acceptance by the Owner.

3. All guarantees and warranties shall not begin until final acceptance of the systems and equipment by the Owner. Acceptance requires, at a minimum, complete systems commissioning.

4. HVAC systems shall be commissioned by an agent hired by the owner. The Mechanical Contractor shall carry the cost to assist the agent in this process.

B. Comprehensive Work Plan

1. Provide detailed, methodical, scheduled start up, and commissioning procedures and execution of same for every system and piece of equipment provided.

2. Develop and submit for approval a specific start up check out and sign off form for each and every system.

3. Systems shall be operated under actual or stimulated full load conditions. Identify the operating conditions in the work plan.

4. Do not cover or conceal work before testing and inspection and obtaining approval.

5. Leaks, damage and defects discovered or resulting from startup and testing shall be repaired or replaced by this contract to like-new condition with acceptable materials. Tests shall be continued until system operates without adjustments or repairs.

6. For each piece of equipment, copy nameplate data and include in report.

3.7 MAINTENANCE

A. Maintain equipment and systems until Final Acceptance. Ensure adequate protection of equipment and material during delivery, storage, installation and shutdown and during delays pending final test of systems and equipment because of seasonal conditions.

B. Subcontractor shall be responsible for cleaning air handling equipment. Clean fan interiors to remove foreign material and construction dirt and dust. Vacuum clean fan wheels, cabinets, and coils entering air face.

3.8 SPECIAL RESPONSIBILITIES

A. Cooperate and coordinate with work of other Sections in executing work of this Section.

1. Perform work such that progress of entire project including work of other Sections shall not be interfered with or delayed.

2. Provide information as requested on items furnished under this Section which shall be installed under other Sections.

3. Obtain detailed installation information from manufacturers of equipment provided under this Section.

4. Obtain final roughing dimensions or other information as needed for complete installation of items furnished under other Sections or by Owner.

5. Keep fully informed as to shape, size and position of openings required for material or equipment to be provided under this and other Sections. Give full information so that openings required by work of this Section may be coordinated with other work and other openings and may be provided for in advance.

3.9 MATERIALS AND WORKMANSHIP

A. Work shall be neat and rectilinear. Install material and equipment as required by manufacturers. Installation shall operate safely and without leakage, undue wear, noise, vibration, corrosion or water hammer. Work shall be properly and effectively protected, and pipe and duct openings shall be temporarily closed to prevent obstruction and damage before completion.

B. References to manufacturers and to catalog designation are intended to establish standards of quality for materials and performance but imply no further limitation of competitive bidding.

C. Finish of materials, components and equipment shall be as approved by Engineer and shall be resistant to corrosion and weather as necessary.

3.10 PAINTING

A. Paint unpainted, non-insulated, non-galvanic, ferrous metal surfaces of pipes, equipment fixtures, hangers, supports and accessories in accordance with project requirements and specifications.

3.11 CUTTING AND PATCHING

A. Do not cut existing construction without prior approval of Construction Manager/Engineer.

B. Provide sleeves, caps, plates, escutcheons, flashing and similar materials required to fill or close openings. Provide final grouting, finish and other materials as required. Make repairs in like and kind to ensure exact patching of surfaces and finishes.

3.12 EQUIPMENT BASES AND SUPPORT

A. Unless otherwise indicated on structural drawings, provide housekeeping pads of concrete, minimum four inches thick, extending six inches beyond equipment supported.

B. Provide templates and accessories for mounting and anchoring equipment.

C. Construct supports of steel members or steel pipe and fittings. Brace and Fasten with flanges bolted to surface.

3.13 FLASHING

A. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weatherproofed or waterproofed walls, floors and roofs.

B. Provide curbs for mechanical roof installations. Flash, counterflash and install per details on drawings and specifications.

3.14 PREPARATION FOR TESTING, ADJUSTING AND BALANCING

A. Mechanical Installer shall:

1. Review Contract Documents and all submittals to verify that piping, instruments, thermowells, valves, ductwork, dampers, measurement and control devices, and access openings have been provided in correct quantity and at correct locations to permit testing and balancing of air, steam and hydronic systems under various operating conditions.

2. Provide V-belt drives, variable frequency drives, initial fixed pitch sheaves or variable pitch sheaves for fans as indicated. Replace variable pitch sheaves or initial fixed pitch sheaves with appropriate fixed pitch sheaves when correct speed (rpm) has been determined by Balancing Subcontractor. Delivery variable pitch sheaves and initial fixed pitch sheaves to the Construction Manager. Notify the Balancing Subcontractor upon completion of sheave replacement.

3. Inform the Balancing Subcontractor regarding major deviations from Contract Documents made to systems during construction and furnish one (1) complete set of Record Drawings, showing presence and location of balancing elements, volume dampers and instrument ports, prior to start of TAB work.

4. Provide indicated Work and submit certification that each operation indicated is complete and in accordance with Contract Documents. This Work must be accomplished before TAB work can start. Within 30 days of notification by Owner of award of Testing and Balancing Contract, submit schedule to complete following Work:

    a. Complete physical installation.

    b. Pressure test air, steam and hydronic systems as required.

    c. Clean, flush, fill and chemically treat steam and hydronic systems as required. Provide temporary startup strainers and replace with clean strainers after system cleaning as indicated.

    d. Provide each air system with start-up filters. Replace filters during construction as required by Construction Manager. Replace with new specified filters upon acceptance of each system by Owner.

    e. Test and operate prime movers, including fans, chillers and pumps at full design load to verify adequate power, proper rotation, completed controls, operational auxiliaries, and complete overall installation.

    f. Balance rotating equipment statically and dynamically.

    g. Secure linkages.

    h. Properly evacuate air from liquid systems. Install air vents at coils and at all high points in systems whether or not expressly indicated, and verify that they operate properly. Verify that expansion tanks are filled, at correct pressure and in proper working order.

    i. Verify that automatic control valves are in proper working order and location that they are marked and installed with correct "NORMAL" positions as required, and that hand valves and balancing valves are positioned for full flow through equipment.

j. Verify that automatic control dampers are in proper working order and location, that they are marked and installed with correct NORMAL positions as required. Verify that balancing and shut-off dampers are positioned for full flow. Verify that equipment, terminal devices and distribution systems are completely and properly connected.

5. For each item of mechanical equipment, furnish to the Balancing Subcontractor data sheets and submittals indicating operating temperature, pressure, flow rate, amperage, voltage, phase, frequency (Hz), rpm and brake horsepower, as appropriate.

6. Deliver to the Balancing Subcontractor, for use until TAB work is complete, flow-indicating devices intended for use with permanently installed primary flow measuring devices. Calibrate permanently installed flow measuring devices and associated display instruments, thermometers, sensors and pressure gauges. Deliver documentation to the Balancing Subcontractor to verify calibrations.

7. Submit schedule stating when each system is ready for TAB work to begin to Construction Manager.

8. Attend all scheduled project coordination meetings with the Balancing Subcontractor. These meetings will be conducted under guidance of the Construction Manager.

9. Provide labor, material, tools and equipment to operate mechanical equipment and systems during TAB work, and for required adjustments, calibrations and repairs of automatic control devices or their components. Provide these services on each working day and without undue delay, as required by the Balancing Subcontractor. Protect and operate equipment and systems during TAB work.

10. When requested by the Balancing Subcontractor, furnish services of personnel to accompany the Balancing Subcontractor when TAB work is being performed.

11. Make modifications at no additional cost and to satisfaction of Owner's Representative to rectify discrepancies reported by the Balancing Subcontractor indicating non-compliance with Contract Documents.

3.15 PROJECT CLOSE OUT

A. General

1. It shall be each subcontractor's responsibility to personally hand-deliver all of the required project close-out checklist items and to obtain owner's authorized representative(s) signed receipt on all items requiring owner sign-off.

B. Project Close-Out Checklist

1. Review requirements of each section of the specifications and submit for approval to Engineer the sign-off forms which shall become the project close-out checklist. These at a minimum shall include the following information shown in attached Project Closeout Checklist Example. The Owner may incorporate additional specific items to the following checklist which shall become part of the project requirements

2. Close-Out Checklist Example

PROJECT:			
DIVISION NO.:			
SUBCONTRACTOR:			
ITEM[1]	DATES		OWNER'S SIGN-OFF
	COMPLETED	RECEIVED BY OWNER	
Permits			
City and County Inspection			
Manufacturers Warranties			
Contractors Warranties			
State Fire Rating Data			
Copy of Final Shop Drawings			
List and Possession of Spare Parts			
Pressure Tests			
Equipment Tests Required by Specs			
O & M Manuals			
Record Documents			
Coordination Drawings			
Commissioning Reports/Letters			
On Site Training Complete			
Final ATC Installation Drawings			
Insurance Underwriters Approvals			
Final Punch List (Initialed by subcontractor that items are complete)			
Building Certificate of Occupancy (CO)			

[1] Provide separate line item for each specified item (do not group items).

+ + END OF SECTION 230000 + +

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EQUIPMENT HANDLING AND SETTING
SECTION 15056

1.0 GENERAL

1.1 SUMMARY

A. Work Includes: furnish all supervision, labor, material, tools, and equipment to receive, unload, uncrate, inspect, move, disassemble, (if necessary), assemble, set in place, anchor and grout all equipment, including all auxiliary items and components, as shown on the drawings and described in the Scope of Work, to include the following:

1. Furnish all anchors, fasteners, grout, and other appurtenances necessary for the anchoring of equipment.

2. Provide safe access for cranes and other material handling equipment necessary for the work.

3. Furnish and place concrete and all materials necessary for inertia bases.

B. Work Not Included:

1. Piping, utilities, and electrical service and connections

2. Equipment painting and insulation

3. Equipment foundations

4. Equipment alignment and balance

5. Concrete cast-in embedments.

6. Fasteners or assemblies connecting to floor plate or grating.

1.2 SUBMITTALS

A. Subcontractor shall submit within 15 working days of award of contract the following as listed herein and on the Submittal Control List.

1. Catalog cuts of anchors, fasteners, grout and other appurtenances used in the Work.

2. Certification that anchor bolts, fasteners, grout and other appurtenances used in the Work meet the design specifications as stated herein.

1.3 DELIVERY, STORAGE AND HANDLING

A. Equipment delivered to the jobsite and received by the subcontractor shall be:

1. inventoried and checked against the bill of lading; discrepancies shall be immediately reported to the Construction Manager (CM).

2. unloaded promptly so as to avoid delaying the carrier; any demurrage charges shall be paid by the subcontractor.

3. handled safely in accordance with requirements and guidelines of OSHA and Owner Safety Policies so as to protect personnel and Owner's property.

B. Subcontractor shall protect all equipment and components from the weather at all times.

C. Equipment and components that are received prior to the scheduled setting shall be stored and protected in accordance with manufacturer's recommendations and as directed by the CM. Storage locations shall be as directed by the CM.

D. Stored equipment shall be protected from the elements and physical damage. Guards, barricades, lights, and other safeguards necessary for protection of persons and property shall be furnished and maintained by the subcontractor.

E. Installed equipment shall be protected from damage until final acceptance by the CM.

F. Instruction manuals and repair kits shall be promptly turned over to the CM.

1.4 SCHEDULING

A. The installation sequence and work schedule will be established by the CM.

B. The subcontractor shall coordinate equipment handling and setting with the CM. Any anticipated delays in completion schedule due to delayed shipments, damaged materials or other causes shall be reported to the CM immediately.

C. Mobilization and demobilization of cranes and other heavy equipment transport shall be coordinated with the CM at least 10 working days in advance.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Cast-in Specialty Anchor Bolts (1/2" diameter minimum):

Type	Manufacturer
Jakebolts & Vector Anchor Bolts	Unisorb Machinery Installation Systems
Standard & Heavy Duty Anchor Bolts	Deco Manufacturing Company
Foundation Bolts	Dekalb Fasteners Inc.

B. Clamps and Specialty Connections:

Type	Manufacturer
Ubolts	Dekalb Fasteners Inc.
Lindaptor Systems	Lindaptor North America, Inc.

C. Cold or hot formed specialized channels or assemblies:

Type	Manufacturer
Unistrut	Unistrut Corporation
B-Line	B-Line Systems Inc.
Hilti Strut	Hilti, Inc.

D. Inserts, Bolts and Anchors (Retrofit Style):

1. Floor Mounted - Concrete

Type	Manufacturer
All types	Hilti, Inc.
All types	Powers/Rawl
All types	Ramset/Red Head

2. Column Mounted

Type	Manufacturer
Adhesive & mechanical anchors	Hilti, Inc.
Adhesive & mechanical anchors	Powers Fastening, Inc. (Powers/Rawl)
Adhesive & mechanical anchors	ITW Ramset/RedHead
Ubolts or other specialty anchors	Dekalb Fasteners, Inc.

3. Wall, Horizontally Mounted (Pilaster or Concrete)

Type	Manufacturer
Adhesive anchors	Hilti, Inc.
Adhesive anchors	Powers Fastening, Inc. (Powers/Rawl)
Adhesive anchors	ITW Ramset/RedHead

4. Hung or ceiling (structural)

Type	Manufacturer
Adhesive anchors, undercut or sleeve anchors	Hilti, Inc.
Adhesive anchors, undercut or sleeve anchors	Powers Fastening, Inc. (Powers/Rawl)
Adhesive anchors, undercut or sleeve anchors	ITW Ramset/RedHead

5. Roof Mounted

Type	Manufacturer
All types	Hilti, Inc.
All types	Powers Fastening, Inc. (Powers/Rawl)
All types	ITW Ramset/RedHead

E. Equipment Grout:

1. V-1 Machinery Mounting and Anchoring Grout by Unisorb providing 5000 psi at 1 day and 11,000 psi @ 28 days.

2. Masterflow 928 by Master Builders Technologies providing 3500 psi @ 1 day and 7500 psi @ 28 days.

3. Sure Grip High Performance Grout by Dayton Superior providing 3500 psi @ 1 day and 7500 psi @ 28 days.

4. C9 200 PC Cementaceous Grout by Hilti providing 2500 psi @ 1 day and 8500 psi @ 28 days.

2.2 MATERIALS

A. Fasteners, anchors, washers, and nuts shall be minimum 5 micron galvanized unless used in wet environments where they shall be:

1. hot dip galvanized, minimum 0.9 oz. per square foot in accordance with ASTM Standards, or

2. stainless steel Type 304.

B. Steel design and fabrication shall be in accordance with:

1. AISC American Institute of Steel Construction

2. AWS American Welding Society

C. Cold formed stainless steel design and fabrication shall be in accordance with ASCE 8 (American Society of Civil Engineering), “Specification for the Design of Cold-Formed Stainless Steel Structural Members”.

D. Plates, bars and shapes shall be in accordance with ASTM A6 and ASTM A36, Fy = 36 ksi, Fu = 50 ksi.

E. Plain rods, threaded rods, anchor bolts, through bolts, and upset rods shall be in accordance with ASTM A307, Fy = 36 ksi, Fu = 60 ksi, or ANSI Type 304 stainless, Fy = 30 ksi min.

F. Stainless steel bolts shall be in accordance with ASCE 8 and one of the following ASTM standards: A193, A276 or A593.

G. Sleeve nuts, clevices, turnbuckles, pins, cotter pins shall conform to the 5:1 safety factors and requirements of AISC and ANSI.

H. Square and rectangular HSS (Hollow Structural Shape) closed sections of steel shall be in accordance with ASCE 8 or ASTM A-500, Grade B, Fy = 46. Round HSS sections and pipes shall be in accordance with ASTM A-53, Grade B, Fy = 35 ksi.

2.3 FINISHES

Exposed steel members shall be prepared per SSPC-SP3 (Structural Steel Painting Council) and prime painted with an approved material applied with no less than 2 mils d.f.t.

3.0 EXECUTION

3.1 EXAMINATION

The subcontractor shall visit the jobsite, verify site conditions, and determine all handling requirements for each piece of equipment to be set in place.

3.2 PROTECTION

A. Floors and roofs shall be protected from all damage while moving and installing equipment.

B. Adequate planking or other means of protection shall be provided to properly distribute loads applied while moving and installing equipment.

C. Cutting, drilling, welding and other modifications to Owner’s property to support or rig equipment shall not be permitted without the approval of the CM. No mechanisms or apparatus required for handling equipment shall be attached to building structural steel without the approval of the CM.

D. Subcontractor shall be responsible for repairing any damages and restoring Owner's property to original condition upon completion of the Work.

3.3 HANDLING AND SETTING

A. Large pieces of equipment shall be moved into their proper rooms prior to removing skids. Smaller pieces of equipment may be uncrated at any convenient location prior to moving into installation area. Instruments and sensitive equipment shall remain packed in cases until ready for installation.

B. Install in accordance with Manufacturer installation recommendations. Manufacturer's installation specialists (where consulted) shall have full authority in all matters concerning method of installation, preparation of materials, workmanship standards, etc. Activities under these specifications shall be coordinated so as not to unduly retain manufacturers' specialists at the jobsite

C. All multi-component equipment shall be handled is such a manner as to avoid any damage, misalignment, separation, etc. of the components. Lifting devices such as eye bolts and lugs shall be supplied when not included with equipment. All costs of repair and/or replacement will be borne by the subcontractor.

D. All equipment shall be set on centerlines and elevations as per plan and elevation drawings and be aligned per manufacturer's instructions.

E. The subcontractor shall furnish all shims, liners, wedges and plates that are required to properly align or level equipment.

F. The subcontractor shall check all anchor bolts before attempting to set equipment. Sleeves, where required, shall be cleaned out and bolts properly positioned. The subcontractor shall drill, weld, and tap as necessary to properly set the equipment. The subcontractor shall assemble and coordinate the installation of all equipment complete with motor, drives, couplings, guards, isolators, inertia bases and other appurtenances.

G. After equipment is set and anchored, subcontractor shall remove lugs, brackets, blocking devices and bracing which were installed solely for shipping and handling, as directed by the CM.

H. Subcontractor shall furnish and place concrete in inertia bases when furnished with equipment.

I. Before permanently setting and grouting equipment with flexible piping connections, the flexible connections shall be in a neutral position proven during actual operating temperatures.

3.4 GROUTING

A. Grouting shall be in accordance with grout manufacturer's recommendations.

B. All dirt, oil, grease and other foreign material shall be removed from concrete and steel surfaces. Defective concrete shall be removed, leaving a level roughened surface.

C. Install equipment to provide a minimum 1" clearance between the top of the concrete and the underside of the equipment base. After equipment is in place and properly leveled and aligned, foundation bolts shall be tightened evenly but not too firmly.

D. Completely fill the clearance space with grout; grout the leveling pieces, shims or wedges in place. The grouting methods shall ensure that no air pockets or hollow areas exist in the equipment base.

E. After the grout has hardened in accordance with manufacturer's recommendations, foundation bolts shall be tightened.

3.5 CLEANING

At the completion of each day's work, the subcontractor shall dispose of all crating materials and construction debris and leave the jobsite broom-clean.

++END OF SPECIFICATION 230560++

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1.0 GENERAL

A. It is the intent of this specification to provide the Contractor with the necessary information to enable him to provide the HVAC water treatment system as noted herein. These items shall be the Contractor's standard design modified as required to meet the operation and design requirements given herein and in the attached Specifications and Contract Drawings.

B. Compliance with the specification does not relieve the Contractor or manufacturer from the responsibility to furnish piping system of proper design and construction suitable for all operational conditions.

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY & SCOPE OF WORK

A. This Section includes water-treatment systems for the following:

1. New and Existing Chilled-water piping (closed-loop systems).

2. Flush and clean all new chilled water and condenser water piping and all the existing condenser water system piping from the outside cooling tower to the indoor sump to the mechanical room. This shall include the removal and reinstallation of all new and old strainers at the new pumps.

1.3 PERFORMANCE REQUIREMENTS

A. Maintain water quality for HVAC systems that controls corrosion and build-up of scale and biological growth for maximum efficiency of installed equipment without posing a hazard to operating personal or the environment.

B. Base chemical treatment performance requirements on quality of water available at project site, HVAC system equipment material characteristics and functional performance characteristics, operating personnel capabilities, and requirements and guidelines of authorities having jurisdiction.

1. Closed system: Maintain system essentially free of scale, corrosion, and fouling.

1.4 SUBMITTALS

A. Product Data: Include rated capacities; water-pressure drops; shipping, installed; and operating weights; and furnished products listed below:

1. Pumps.

2. Chemical solution tanks.

3. Agitators.

4. Control equipment and devices.

5. Test equipment.

6. Chemicals.

7. Filters.

8. Chemical feeders.

9. Side stream filter.

B. Shop Drawings: Detail equipment assemblies indicating a dimension, weights, loads, and required clearances, method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Detail power and control wiring and differentiate between manufacturer- installed and field-installed wiring.

C. Water Analysis: Submit a copy of the water analysis to illustrate water quality available at Project site.

D. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

E. Maintenance Data: For pumps, Agitators, filters, system controls, and accessories to include in maintenance manuals specified in division 1.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is an authorized representative of the chemical treatment manufacturer for both installation and maintenance of chemical treatment equipment required for this project.

B. Electrical components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 MAINTENANCE

A. Scope of Service: Provide chemicals and service program for maintaining optimum conditions in the circulating water for inhibiting corrosion, scale, and organic growths in the hydronic, steam, and condensate piping systems and equipment. Services and chemicals shall be provided for a period of one year from date of substantial Completion, including the following:

1. Initial water analysis and recommendations.

2. Startup assistance.

2. Periodic field service and consultation.

3. Customer report charts and log sheets.

4. Laboratory technical assistance.

5. Analyses and reports of all chemical items concerning safety and compliance with government regulations.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. HVAC Water-Treatment Products:

a. Nalco Chemical Co.
b. Betz Dearborn.
c. DuBois Chemicals, Inc; DuBose USA Subsidiary.

2.2 CHILLED & CONDENSER WATER SYSTEMS

A. Furnish chemicals recommended by water treatment system manufacturer that are compatible with piping system components and connected equipment.

B. Provide detailed water analysis report for both systems.

C. Provide chemicals for system flushing

D. Furnish a one year's supply of liquid closed loop inhibitor for control of scale and corrosion in a closed recirculating system. A closed loop is a recirculating system which has less than 10% makeup when compared to its system volume. A corrosion inhibitor shall be provided at startup. Formulations shall not contain any ingredients which may be harmful to system materials of construction. The corrosion inhibitor shall contain a multi-functional blend of nitrate, molybdate, tolytriazole, anionic polymer, and buffering agent. Provide MSDS sheets on all chemical products. No system shall be operated without the benefit of chemical protection.

E. Furnish and Install new cooling tower water treatment equipment including:

1. Tower Conductivity and pH Controller with:

- Bleed
- Feed
- Dual Biocide Additions
- pH Acid Control
- Flow Switch
- Water Meter input
- Ethernet Connection
- Sample Port
- Mounted on Board

2. 32”H x24” W panel for single tower setup including:

- White PVC Board
- Chemical Injection Ports
- 2 coupon stations
- 2 – ¾” ball valves
- Flow meter
- Sensor and flow switch housings
- shelf

3. (3) chemical meters
4. Spill containment platform
5. 1” water meter
6. ¾” brass motorized ball valve for cooling tower bleed, powered open swing return.

F. Furnish and Install new chilled water system treatment equipment including:

1. Neptune 5 gallon filter feeder and (2) filter bags
2. 2 station coupon rack – Black Iron
   - ¾” mounted with ball valves
   - 300 psi max. 300 deg. F. max.
   - Sample port
   - Panel mounted

G. Provide (1) corrosion coupon study per system.

H. (1) year of monthly water analysis.

I. Service reports detailing the water analysis with stated control ranges along with corrective actions taken while onsite and recommendations to improve operating conditions.

J. Training for operators on water analysis, adjustments, troubleshooting and basic water treatment principles.

3.0 EXECUTION

3.1 WATER ANALYSIS

A. Perform an analysis of supply water to determine the type and quantities of chemical treatment needed to maintain the water quality as specified in “Performance Requirements” Article.

3.2 INSTALLATION

A. Install treatment equipment level and plumb.

B. Add chemicals as recommended by manufacturer.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other division 15 sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to equipment to allow service and maintenance.

C. Confirm applicable electrical requirements for connecting electrical equipment.

D. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque tighten values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

A. Engage a factory authorized service representative to perform service.

1. Inspect field assembled components and equipment installation, including piping and electrical connections. Report results in writing.

2. Inspect piping and equipment to determine that systems and equipment have been cleaned, and filled with water, and are fully operational before introducing chemicals for water treatment systems.

3. Place HVAC water treatment system into operation and calibrate controls during the preliminary phase of HVAC systems startup procedures.

B. Test chemical feed piping as follows:

1. Do not enclose, cover, or put piping into operation until it is tested and satisfactory test results are achieved.

2. Test for leaks and defects. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

3. Leave uncovered and unconcealed new, altered, extended, and replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.

4. Cap and subject piping to static water pressure of 50 psig above operating pressure without exceeding pressure rating of piping system materials. Isolate test source and allow test pressure to stand for four hours. Leaks and loss in test pressure constitute defects.

6. Repair leaks and defects with new materials and retest piping until satisfactory results are obtained.

7. Prepare test reports, including required corrective action.

3.5 ADJUSTING

A. Sample chilled water at one week intervals after chiller startup for a period of five weeks, and prepare certified test report for each required water performance characteristics. Where applicable, comply with ASTM D 3370 and the following standards:

1. Silica: ASTM D 859
2. Steam System; ASTM D 1066
3. Acidity and Alkalinity: ASTM D 1067
4. Iron: ASTM D 1068
5. Water Hardness: ASTM D 1126

B. Occupancy Adjustments: Within 12 months of substantial Completion two separate water analyses to prove that automatic chemical feed systems are maintaining water quality within performance requirements specified in this section. Perform analyses at least 60 days apart. Submit written reports of water analysis.

3.6 FLUSHING

A. The contractor shall provide chemicals and equipment for the pre-operational cleaning of all chilled, hot water and related equipment piping systems. This cleaning method is not intended for potable water systems.

B. All systems must be prepared prior to the introduction of the chemical cleaner.

C. Contractor shall flush all systems. Remove, clean and replace all strainers. All systems shall contain the highest quality of water available.

D. Complete circulation must be achieved during the cleaning procedures. Building pumps shall not be used for water circulation. Isolate pumps from system and provide temporary piping bypass. A minimum flow rate of 2ft/sec needs to be maintained to insure that the cleaning chemicals will work properly. All manual, electrical, air and thermostatic operated valves must be open. All dead end runs must be looped together with piping not less than 1/3 the size of the run. This piping is to remain in place until cleaning is complete.

E. A minimum 1-1/2” ball or gate valve is to be permanently installed in the low point of each system for the purpose of draining each system.

F. The cleaner shall not require external heat to ensure its effectiveness.

G. The cleaning solution shall be formulated to remove light grease, cutting oils, loose mill scale, organics, and extraneous construction debris. The cleaner shall contain inorganic phosphate, and is Nalprep ONDEO Nalco 2567 or approved equal. Enough cleaner should be used to treat all of the piping to remove oil and grease and to permit a uniform passivating film to form. This aids in the prevention of flash corrosion when the system is most vulnerable to corrosive attack.

H. Install temporary piping bypass at the chiller between the 4” CHWS and CHWR piping to avoid flushing thru the new chiller evaporator.

3.7 DEMONSTRATION

A. Engage a factory authorized service representative to train Owners maintenance personnel to adjust, operate, and maintain HVAC water treatment systems and equipment.

1. Train Owners maintenance personnel on procedures and schedules for starting and stopping troubleshooting, servicing, and maintaining equipment and schedules.

B. Review manufacturer's safety data sheets for handling of chemicals.

C. Review data in maintenance manuals, especially data on recommended parts inventory and supply source and on availability of parts and service. Refer to division 1 section contract closeout.

D. Review data in maintenance manuals, especially data on recommended parts inventory and supply sources and on availability of parts and service. Refer to division 1 section Operation and Maintenance Data.

E. Schedule at least two hours of training with owner, through General Contractor, with at least seven days advance notice.

+ + END OF SECTION 231890 + +

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1.0 GENERAL

1.1 INTRODUCTION

A. This Specification is intended to establish the minimum requirements, acceptable materials, and application techniques for the insulation of all piping, vessels, valves, instruments, equipment and other components as identified on the referenced drawings and equipment lists.

B. This standard does not cover building insulation or insulation for noise attenuation.

1.2 DEFINITIONS

A. Vessels: Includes tanks, drums, reactors, towers, heat exchangers, and any other large cylindrical process items.

B. Equipment: Includes compressors, pumps, filters, or other small complex mechanical items.

C. The word "interior" shall be taken to mean any ductwork or insulation which is located inside a structure, not exposed to weather.

D. The word "exterior" shall be taken to mean any ductwork or insulation which is located outside of a structure, or is otherwise subjected to the weather.

1.3 CODES, REGULATIONS, AND STANDARDS

A. This specification shall supplement but not supersede all applicable legal requirements which may be more severe in application. The Insulation Contractor (hereafter the Contractor) shall be responsible for verifying that the materials furnished and work performed under this specification conform to all local, provincial, and national codes or laws currently in effect at the plant location. Any conflicts shall be referred to the Owner or Owner's Representative for resolution.

B. The latest published issue of standards, recommendations, or requirements of the societies, associations, or institutions listed below shall be followed and considered as minimum requirements.

A&SC	Adhesive and Sealant Council
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
FM	Factory Mutual
NFPA	National Fire Protection Association
NAIMA	North American Insulation Manufacturer's Association
OSHA	Occupational Safety and Health Association
UL/UL-C	Underwriter's Laboratory

1.4 SCOPE OF WORK

A. All new chilled water piping, expansion tank connection piping and cold water make-up piping as indicated on the contract drawings.

B. New primary pumps in the Library mechanical room.

C. New expansion tank in the Library mechanical room.

D. All surface cleaning, painting, and labeling of insulated surfaces will be performed by others.

E. The Contractor shall furnish all materials, labor, supervision, and equipment necessary to perform a complete, expeditious, and workmanlike installation of thermal insulation within the scope of this specification. This shall include, but is not limited to, the following:

1. Furnish all insulation, jacketing, and finishing materials including bands, wiring, supports, and any other fasteners required to secure the insulation to piping and equipment, and to protect the insulation from weather and moisture penetration.

2. Delivery, receiving, unloading, storage, weather protection, and on-site movement of all materials from point of delivery to installation location. The Contractor shall visit the site and acquaint himself with the location and conditions of the job. The Owner or Owner's Representative will allocate warehouse space for storage of materials, provided such storage space is available. If there is no warehouse space available, the subcontractor shall include in his bid the cost of erection and removal, including materials, of a suitable warehouse to meet his requirements.

3. Furnish all supervision, labor, construction equipment, tools, scaffolding, and rigging required for the insulation installation. This shall include any temporary buildings required for office space, change rooms, storage, or fabrication. All of the above shall be removed by the Contractor at the completion of the work.

4. Coordinate with the Owner or Owner's Representative with regard to scheduling of the installation, and obtain clearance before beginning work. The intent is to make sure that all lines and equipment are tested and free of leaks, and that all surfaces are clean, dry, and free of scale, dirt, oil or other foreign substances prior to being insulated.

5. Surfaces to be insulated should require no surface preparation by the Contractor, other than to brush off any loose scale or dirt not tightly adhering to the surface. Surface preparation beyond this should be brought to the attention of the Owner or Owner's Representative.

6. Insulate surfaces and finish the insulation with the applicable materials as specified in this document. This work includes providing anchorage and support as required for insulation on vessels and mechanical equipment. Clearance shall be obtained from the Owner or Owner's Representative before any drilling, cutting, or welding for the supports is done. No modification of an ASME or ABSA code-stamped vessel will be permitted.

1.5 OWNER INSPECTION

A. An inspector representing the Owner shall have the right to inspect all work and material at the factory or at the site, and any work or material found to be defective or which does not meet the requirements of this specification shall be replaced by the Contractor at his own expense. Such inspection shall not relieve the Contractor from full responsibility for the quality and correctness of his materials and work. Final inspection is required during initial plant operation to determine accuracy of thermal expansion and contraction provisions.

2.0 INSULATION MATERIALS

2.1 POLYISOCYANURATE INSULATION

A. Pipe insulation shall be rigid polyisocyanurate non-fibrous pipe covering manufactured by Dow. Provide Dow Trymer 2000XP with a thermal conductivity of 0.18 BTU-in/hr-ft^2-°F at 75°F (.027 W/m-°K@24°C) and a density of 2.05 lb.cubic foot. Flame spread shall be less than 25 and smoke developed index of less than 450 per ASTM E84.

B. For insulation to be used in cold service, insulation shall be furnished with a factory applied vapor barrier coating. The vapor barrier shall be shall be Saran 540 Vapor Retarder Film and Saran 520 Saran Vapor Retarder Tape. Refer to ASTM standards C-755, ASTM C921 and C-1136. The PVC jacketing shall NOT be used as a vapor barrier.

C. Manufacturer's recommended system of sealing butt joints, pipe cover longitudinal seams, fitting covers, nozzle projections, and pipe support penetrations, must be followed.

2.2 VINYL NITRILE INSULATION

A. When vinyl nitrile insulation is specified the insulation shall be a flexible, closed cell elastomeric material with a minimum density of 4.0 lbs/cubic foot such as Armacell LLC AP Armaflex® product or approved equal. The insulation shall have a thermal conductivity not to exceed 0.27 GTU-in/hr-ft^2 – °F.

B. In order to prevent condensation due to moist air infiltration the insulation manufacturer's recommended system of sealing butt joints, pipe cover longitudinal seams, fitting covers, nozzle projections and pipe support penetrations must be strictly followed.

2.3 EQUIPMENT INSULATION

A. Apply insulation after systems have been tested, proved tight and approved by the Owner/Engineer of Record. Remove dirt,scale, oil, rust and foreighn matter prior to installation of insulation.

B. No leaks in vapor barrier or voids in insulation will be accepted.

C. Insulation shall be polisocyanurate rigid block or semi-rigid board rated for temperature intended. Insulation shall be formed or fabricated to fit equipment. Bevel edges and butt stagger joints. For cold equipment vinyl nitrate can be used with appropriate vapor barrier.

D. Secure with bands or wires at intervals recommended by manufacturer, no more than 12" centers. Provide corner angles.

E. Equipment which needs servicing, such as pumps and plate heat exchangers shall be provided with removable insulation sections.

F. See section 3.7 for thickness requirements.

3.0 EXECUTION

3.1 GENERAL REQUIREMENTS

A. All insulation material adhesives, finishes, and accessories shall be fire resistive, having a flame spread rating of 25 or less and a smoke rating of 50 or less when tested by ASTM E-84 or UL. The Insulation Contractor shall furnish the UL label, listing, or a certified test report for each material to verify that the above fire hazard ratings are not exceeded. No asbestos or materials containing asbestos shall be used.

B. For vessels, all fiberglass, calcium silicate, and cellular glass insulation shall be installed and supported such that it meets the standards of the API and NFPA 30 with regard to staying intact, attached, and protective of the subsurface under fire exposure conditions.

C. All surfaces to be insulated shall be clean and dry. Insulation shall not be applied on damp or frosty surfaces. Surfaces shall be warm (above 40˚ F/4˚ C), if possible, and in no case shall insulated surface temperature fall outside the insulation manufacturer's recommended range during application. Insulation materials shall be brought to the manufacturer's recommended application temperature range before installation.

D. Valves, flanges, fittings, and other in-line items in insulated lines shall be insulated unless specified otherwise by the owner. Insulation thickness and materials shall be the same as the adjacent piping. The insulation shall be readily removable for maintenance without disturbing adjacent insulation.

E. Install 2" thick canvas, removable jacket for the balancing valves 1 ½" and larger.

F. Where insulation of valves is specified, gate and globe valve bodies shall be insulated up to the packing gland. Insulation shall not interfere with adjustment or removal of packing gland and shall be sealed to valve body with suitable mastic. Ball, plug and butterfly valves will be supplied with extension stems so that the entire body may be insulated.

G. All nameplates, code inspection plates, stampings or similar identification marks, instrument readouts, and view ports must remain visible after insulation is applied.

H. Where openings in the insulation are required for flanges, nameplates, and other access-requiring items, the surrounding insulation shall be carefully beveled and sealed against moisture penetration.

I. Insulation shall be continued through walls, partitions, floors, and sleeves unless otherwise noted. A minimum clearance of one inch shall be maintained between insulation surfaces and any obstructions such as stairs, platforms, or other piping.

J. Insulation shall be of the best grade and the installation should be of high quality with smooth and even surfaces. All materials shall be new and furnished to the job site in factory-sealed containers. Scrap pieces of insulation shall not be used in lieu of full length pieces. All insulation, adhesives, sealers, and vapor barrier coatings shall be compatible and shall not soften, corrode, or otherwise attack each other or the insulated surface, either wet or dry.

K. The Contractor is responsible for adequate weather protection of all materials before and during application. Any materials damaged by weather, or if applied insulation gets wet before it is weatherproofed, shall be replaced by the Contractor at no cost to Owner.

L. Installation of all insulating materials, accessories, and finishes shall be in accordance with the manufacturer's latest published recommendations and instructions. Manufacturer's instructions that are more severe than this specification shall take priority. All conflicts shall be referred to the Owner or Owner's Representative for resolution.

M. The design of the insulation system shall include provisions to allow for the thermal dimensional changes in the piping and equipment. Expansion joints shall be installed per the insulation manufacturer's recommendations to prevent damage to vapor barriers and jacket materials. The thermal resistance and mechanical integrity of the insulation system shall not be affected by normal vibration or movement of the piping and equipment.

N. At all times during the work, the Contractor shall organize his equipment, tools, scaffolding, and materials in a neat and workmanlike manner so as to avoid interference with the work of other trades working on the project. He shall protect all adjacent surfaces of equipment, structures, piping, walks, and roads against fouling or staining by his materials and shall remove all debris, drips, splatter, and the like from the working area promptly. He shall continuously police the area and shall leave the area free of all debris at the end of each working day. The contractor is responsible for proper disposal of all debris and leftover material.

O. Instrument lead lines shall be insulated as shown on instrument installation drawings. Pressure gauge piping, control valves, flow indicators, etc., when installed in lines that are insulated, shall be insulated.

P. The materials listed in this specification represent Owner's acceptable products. Where materials are identified by trade names, materials considered to be equivalent may be used only when approved by the Owner's insulation engineer in writing.

Q. On pre-insulated equipment, the Contractor is responsible for continuing pipe insulation up to the equipment insulation and making a moisture-tight joint between the pipe and equipment insulation jacketing.

R. The preferred method of support of insulated pipe, particularly for cold service, is to use saddles or hangers exterior to the insulation. The Contractor shall refer to the insulation manufacturer's recommendations with regard to the spacing of supports and the use of reinforcing metal saddles and/or sections of high density insulation at supports. Where piping must be insulated around supports, the insulation shall cover the support out to a distance of four inches from the pipe.

S. Any pressure/leak testing must be completed prior to the application of the insulation.

3.2 ANTI-SWEAT INSULATION

A. Except where specifically noted in the project documents, all lines and equipment operating below 60°F/15°C shall be insulated for the control of condensation. Thickness of insulation will be as indicated in Section 3.7 of this specification.

3.3 JACKETING (INTERIOR)

A. All interior insulation shall be covered by PVC jacketing. In general, insulation jacketing shall be gloss white heavy gage PVC.

B. Jacketing on small equipment, such as pumps and exchangers, shall be removable-type.

C. Jacketing on irregular surfaces shall use either white sheet plastic or white mastic with fiberglass cloth reinforcing (whichever will provide the best installation).

D. For PVC jacketed piping, both indoors and outdoors, the Contractor shall furnish and install Zeston 300 series, Knauf-Proto, or approved substitute gloss white UV resistant PVC jacketing and fitting covers. Minimum thickness for outdoor application shall be .030"(0.76 mm), and .020" (0.5mm) for indoor applications.

1. Zeston Perma-Weld 300 solvent welding adhesive, or approved equal (suitable for hot or cold service), shall be used to permanently seal all PVC lap joints in the system. Cementing is the only approved method of fastening plastic jackets and fitting covers.

2. Application of jacketing system shall strictly conform to manufacturer's instructions for installation and sealing to gain USDA acceptance.

3. Seams of adjacent fittings and piping jackets should be straight, and in line with each other and the main axis of the pipe. Diagonal seams are not acceptable.

4. End caps are required at all terminations of insulation.

5. Caulking is required at termination points and breaks in insulation, such as at diaphragm valves and pipe supports on insulated sanitary stainless steel tubing systems. Caulk is applied to the end of the insulation and filleted all around the adjacent tubing. Immediately thereafter, before the caulking has set-up, the end cap is installed, allowing some of the caulk to 'ooze' from between cap I.D. and tubing. Finally, using plastic spoon or equivalent item, smooth the bead of caulking and wipe up any excess caulk. Only FDA approved caulking of white or transparent color is to be used, suitable for the temperatures listed in the line table.

3.4 JACKETING (EXTERIOR)

A. Jacketing shall be aluminum metal cladding. Jacketing shall be aluminum alloys 3003, 1100 or 3105 meeting ASTM B-209 with H-14 temper and minimum 2 ½ mil thickness polysurlyn* moisture barrier on the inner side. Thickness shall be 0.016".

B. Aluminum jacketing for all fittings, tees, elbows, valves, caps, etc. shall be sectional, factory contoured, or field-fabricated to fit closely around insulation.

C. Banding for jacketing shall be 0.02" thick by 1/2" wide stainless steel.

D. Aluminum protective jacketing shall not be considered a vapor retarder.

E. Neither rivets, screws, staples nor any other fastener capable of penetrating the underlying vapor retarder shall be used to secure the aluminum jacketing.

3.5 HARDWARE

A. Hardware materials (wire, bands, seals, clips, pins, washers and screws) shall be:

1. 304 stainless steel for use with stainless steel and PVC jacketing

B. Hardware shall be sized as follows:

1. For piping, up to 30" (762 mm) diameter, use banding 1/2" (13 mm) wide by 0.020" (0.5 mm) thick.

2. For vessels use banding 3/4" (20 mm) wide by 0.020" (0.5 mm) thick.

3. Expansion springs shall be Type 18-8 stainless steel 2" (50 mm) long. Acceptable suppliers are Childers and Techalloy or approved equal.

4. "S" clips shall be fabricated of 3/4" (20 mm) wide by 0.020" (0.5 mm) thick banding.

5. Weld pins and speed washers shall be 20 gauge size. Self-locking washers may be 2" (50 mm) round or square.

6. Sheet metal screws for fastening the metal weatherproofing to steel supports shall be 1/4" (6.4 mm) diameter by 1/2" (13 mm) long, Style B, hexagonal head, self-tapping and with neoprene washer under head.

3.6 INSPECTION

A. Inspect all insulation and accessory materials to be certain they are applied in conformance with this specification and manufacturer's recommendations. Joints should be tight, sealing and flashing shall be thorough and watertight, and finishes uniform and free of defects.

3.7 PIPE & EQUIPMENT INSULATION THICKNESS SCHEDULE

Pipe Service	System Designation	Insulation Description	≤ 1 ½”	> 1 ½”	Operating Temp.
Interior Chilled Water	CHWS & CHWR	Polyisocyanurate & PVC Jacketing	1”	2”	45º F

Schedule Notes:

1. Insulate valves, balancing valves, strainers, etc, with 2” of vinyl Nitrate and Metal Jacketing.

2. No fiberglass insulation shall be allowed on any piping system.

+ + END OF SECTION 232500 + +

TABLE OF CONTENTS

1.0 GENERAL

A. This specification covers supports and hangers for all mechanical piping systems.

B. This section shall include all tools, equipment, and materials needed to install the hangers and supports listed in the contract documents and/or this specification.

1. Steel pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Thermal-Hanger shield inserts.
5. Fastener Systems.
6. Pipe Stands.
7. Pipe positioning systems.
8. Equipment supports.
9. Inserts and Anchors

C. The Mechanical Contractor (hereafter the Contractor) shall furnish and Install hangers and supports (as required for piping systems) and any miscellaneous steel required for supporting the piping and for attachment of hangers and supports.

D. The work shall be designed and installed with regard to appearance and convenience as well as in compliance with all applicable laws, regulations, and industry standards. Details of all attachments are subject to the approval of the Owner or Owner's Representative.

E. The Contractor shall obtain approval by the Owner or Owner's representative before proceeding with the drilling or punching of any holes in the building structure. Written approval must be obtained.

F. All piping shall be furnished with seismic restraints in accordance with Seismic Hazard Level of the Seismic Restraint Manual: Guidelines for Mechanical Systems and in accordance with any applicable local codes. Refer to section 2.0 this specification.

G. Attachment of supports or hangers to columns or beams which require fire proofing shall be coordinated with the fire proofing contractor. Fire proofing removed by the Contractor shall be replaced at their cost.

1.1 PERFORMANCE REQUIREMENTS

A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

C. Where not fully called for in the contract documents, design of hangers and supports shall confirm to accepted engineering practice using factor of safety of 2-1/2.

D. All pipe hangers and supports shall confirm to ANSI B31.1- Power Piping, and Documents MSS SP-58 and SP-69 of the manufacturers standardization Society of the Valve & Fittings Industry.

1.2 SUBMITTALS

A. Submit each item in this Specification according to the conditions of the Contract and Division 1 Specification Sections.

1. Steel pipe hangers and supports.
2. Thermal-hanger shield inserts.
3. Powder-actuated fastener systems.
4. Pipe positioning system.
5. Inserts & Anchors

B. Shop drawings are to include fabrication and installation details and include calculations for the following.

1. Trapeze pipe hangers. Include product data for components.
2. Metal framing systems. Include product data for components.
3. Pipe stands. Include product data for components.
4. Equipment support.
5. Drawings covering all specially designed hanger assemblies and fabrications.

C. Welding Certificates

1.3 QUALITY ASSURANCE

A. Welding: Qualified procedures and personnel according to AWS D1.1 “Structural Welding Code-Steel.”

B. Welding Qualified procedures and personnel according to the following:

1. AWS D1.1, “Structural Welding Code—Steel.”
2. AWS D1.2, “Structural Welding Code—Aluminum.”
3. AWS D1.3, “Structural Welding Code—Sheet Steel.”
4. AWS D1.4, “Structural Welding Code—Reinforced Steel.”
5. ASME Boiler and Pressure Vessel Code: Section IX.

C. Listing and Labeling: Provide products specified in this Section that are UL listed and labeled.

1.4 DESIGN AND SELECTION INSTRUCTIONS

A. Piping shall be supported, anchored, or guided to prevent undue line deflection or excessive vibration, and to protect piping connected to equipment from excessive loading and expansion stresses.

B. Supports for all lines are to be selected by the contractor (unless otherwise indicated on the drawings or specified herein.

C. Wherever possible, pipes shall be supported in groups at a common support elevation using resting type structural supports or rack framing.

D. Non insulated lines shall rest on support member.

E. Steel shoes shall be used for anchors, guides, and resting supports on lines insulated for heat conservation unless otherwise specified or indicated on the drawings.

F. All lines routed in pipe racks (horizontal and vertical) must be guided. Spacing of guides not to exceed 25 ft for lines ≤ 2 1/2" and 40 ft for lines ≥ 3" unless otherwise noted on drawings.

G. Individual lines may be suspended via hanger rod assemblies (when not supported in common groups) see section 2.0 for additional details.

H. Concentrated point loads, such as control valves, duplex strainers, line mounted instruments, etc., shall be individually supported.

I. Loads at pump suction and discharges shall be supported in a manner that will comply with manufacturer's recommendations per vendor drawings.

1. When manufacturer's allowable loads are not available, utilize API Std. 610 allowable loads for comparison with reaction load due to thermal expansion. Considerations should be made for lower than API allowable loads for ANSI pumps. Mechanical Loads (dead wt.) shall be handled by adequate support location.

J. Adjustable supports are required on piping connections to pumps, turbines, and compressors.

1. Rod hangers or adjustable type base supports shall be used to ease equipment strain and facilitate erection. When space does not permit adjustable type base support, then a rigid stanchion may be used provided leveling nuts are specified under base plates.

K. Supports shall be located as near as practical (2ft. maximum) to all changes in direction (horizontal and vertical).

L. The design and selection of supports shall ensure that bare lines do not rest on concrete so as to avoid accelerated corrosion of piping at the point of contact.

M. Where rigid supports cannot be used due to vertical expansion of piping, it is necessary to provide spring assemblies which will allow the piping to move and still maintain support. Design of these types of supports shall be by this Contractor.

N. Where there is horizontal movement at a hanger location, the vertical angle of the rod shall be limited to 4 degrees.

O. For movement greater the 2", set shoes off center half the amount of expansion at point of support in the opposite direction of movement.

P. Notify Owner if pipe support loads exceed 2000 lb. at column lines. Loads between column lines will transfer to the column line and are to be considered as part of the column line load. Attachments to building structural elements shall be mechanical. Welding to building steel is per specific approval by owner.

1.5 SUPPLY, FABRICATION, AND INSTALLATION INSTRUCTIONS

A. Pipe supports may be shop or field fabricated. The contractor shall be responsible for purchasing all pipe support materials required to complete construction.

B. Pipe supports, such as trunnions and base ells, for shop fabricated with the piping.

C. Hanger rods shall be set vertically plumb.

D. Structural steel shoes for anchors, guides, and resting supports shall be set in place under pipe and offset adjusted per section 1.4 of this specification before welding pipe.

E. Rod hangers and spring assemblies are to be shipped completely assembled.

F. During hydrostatic testing of lines supported by springs, counterweights, etc., temporary rigid supports or blocking must be installed to prevent excessive strain on piping and equipment and overloading of spring devices.

G. All Shoes, trunnions, and other metal to metal type sliding supports shall be cleaned by wire brushing to ensure unrestricted movement.

H. Shipping rods on expansion joints are to be removed after installation of joints.

1. Pipe must be properly anchored and guided before testing lines with expansion joints.

2. Where tie rods are used, care should be taken to see that they are locked in proper position before testing and re-adjusting.

I. The Contractor may suggest alternative support methods to those shown on piping drawings if a more cost effective or practical method would result, however, alternative methods may not be implemented until expressly approved by the engineer.

J. Compression spring hangers and supports are shipped to the jobsite assembled with the spring compressed.

1. The Contractor shall adjust the spring to the cold load as indicated on the pipe support sketch. Cold setting should take place after hydro test and mechanical completion but prior to final alignment of associated equipment.

1.6 SEISMIC REQUIREMENTS

A. General

1. Seismic bracing shall be provided as required by the applicable Building Code for this project.

2. Seismic bracing support details shall be chosen from the typical bracing details provided on the drawings. Correct sizing, spacing, and materials for restraints shall be chosen from the B-line Seismic Restraint catalogue produced by Cooper B-Line. A copy of the seismic Restraint Manual shall be kept on the job site for the duration of the project.

B. Seismic restraints may be omitted from piping supports if all of the following conditions are satisfied.

1. The piping is made of ductile material with ductile connections.

2. Lateral motion of the piping does not cause impact of fragile appurtenances (e.g. sprinkler heads), equipment, piping, building structure, or structural member.

3. Lateral motion of piping does not cause loss of the system vertical support.

4. Rod hung supports of less than 12” in length have top connections that cannot develop moments.

5. Support members cantilevered up from the floor are checked for stability.

C. Seismic restraints may be omitted for the following conditions where flexible connectors are provided between components and the associated piping:

1. Fuel piping less than one inch inside diameter.

2. All other piping less than 2 1/2 inches inside diameter except medical gas piping (including vacuum)

3. All piping suspended 12” or less from top of pipe to bottom of structural support.

2.0 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Pipe Hangers and Supports

a. Hanger shall be Carpenter and Paterson, F&S, or Grinnell Co. Figure numbers of Carpenter and Paterson are specified to establish standards of quality for performance and materials.

b. Hangers and Pipe shields shall be sized for the pipe and insulation thickness. No shaving will be allowed. See pipe insulation Specs for insulation thickness requirements.

2.2 INSERTS, ANCHORS AND BEAM SUPPORTS

A. Where support rod sizes exceed 7/8” diameter or where the load exceeds the recommended load for the insert or anchor, use two inserts or anchors with trapeze-type connecting member below the concrete.

B. Where installation can be made before the concrete is poured, use Figure 650 or 650N.

C. Where installation is made after the concrete is in place, use Phillips “Red Head” expansion anchors, raw studs, raw self- drilling anchors, Hilti Kwik-Bolts.

D. Plastic, lead or fiber screw anchors, lag screws, and expansion shields are not

acceptable.

E. Where continuous inserts are required, they shall be Unistrut or approved equal, formed from not less than 12 gauge galvanized steel with anchors spaced on not less than 6" center, and with end caps, splice plates, bolts, and nuts as required by conditions. In rooms with defined environmental requirements, more sanitary provisions must be made as called for on the drawings or elsewhere in these specifications.

F. For attachment to beams, use Figures 82, 217, 268, 297, 314, or 702.

2.3 SINGLE PIPE HANGERS

A. Single pipe hangers shall be supported by hangers suspended by galvanized steel rods from structural steel members, concrete ceilings and beams, bottom of trapeze hangers and wall mounted steel angle brackets.

B. Hanger rods shall be hot rolled steel, machine threases and galvanized after fabrication. The strength of the rod shall be based on its root diameter.

C. Except as otherwise specified herein, pipe hangers shall be adjustable clevis type similar to Grinnell Figure Numbers 65,260, and 590 as required. Hangers shall be carbon steel with a galvanized finish.

D. Where pipes are near walls, beams, columns, etc. and located an excessive distance from ceilings or underside of beams, welded steel wall brackets similar to Carpenter and Paterson Figure number 69-68, 84 or 139 shall be used for hanging pipe. Brackets shall be galvanized. Where single pipes rest on top of bracket pipe supports, attachments shall meet requirements as specified under multiple pipe hangers.

2.4 MULTIPLE PIPE HANGERS

A. Suspended multiple pipe, running parallel in the same horizontal plane which are adjacent to each other shall be suspended by trapeze type hangers or wall brackets. Trapeze hangers shall consist of galvanized structural steel channel supported from galvanized threaded rod or attached to concrete walls, columns, or structural steel support members as required to meet the intent of this specification. Channel shall be similar to F&S Figure 710, rods, concrete inserts; "C" Clamps, beam clamps, welded beam attachments, and expansion shields shall be as specified in section 2.3 Single Pipe Hangers.

B. Except as otherwise specified herein pipe anchors used for attaching pipe to trapeze or multiple pipe wall brackets shall be anchor or pipe chair similar to F&S Figures 158, 419, 160A, or 160B as required. Materials of construction shall be galvanized steel. Chair "U" bolts shall be tightened to allow freedom of movement for normal expansion and contracting except when pipe must be anchored to control direction of movement or act as a thrust anchor.

2.5 SINGLE AND MULTIPLE PIPE SUPPORTS

A. Single pipe located in a horizontal plane close to the floor shall be supported by one of the methods specified herein or as shown on the drawings.

B. Pipe 3" diameter and larger shall be supported by adjustable stanchions similar to F&S Figure 427 and constructed of galvanized steel. Stanchions shall provide at least 4" of adjustment and flange mounted to floor.

C. Pipe less than 3” in diameter shall be held in position by supports fabricated from steel C channel, welded post base similar to Unistrut Figure p2072A, and pipe clamps similar to Unistrut Figures P1109 thru P1126. Where required to assure adequate support, fabricate supports using two vertical members of sufficient load capacity to support pipe. Wherever member to provide horizontal rigidity, more than one pipe may be supported from a common fabricated support. All supports unless specified elsewhere shall be galvanized.

D. Where required, pipe shall be supported using concrete anchor posts. Pipe shall be securely fastened to concrete anchor posts using suitable metal straps as required and approved by the engineer.

2.6 WALL SUPPORTED PIPES.

A. Single or multiple pipes located adjacent to walls, columns, or other structural members shall, whenever deemed necessary, be supported using welded steel wall brackets similar to Carpenter and Paterson figure numbers 69-78, 84 , or 134; or “C” Channel with steel brackets similar to Unistrut pipe clamps. All members shall be securely fastened to wall column, etc. using double expansion shields or other method as approved by the engineer.

B. Pipe shall be attached to supports using methods specified herein.

C. All supports shall be galvanized. Unless noted otherwise.

2.7 BASE ANCHOR SUPPORT

A. Where pipes change direction from horizontal to vertical via a bend, a welded or cast base anchor support shall be installed at the bend to carry the load. The bend anchor shall be fastened to the floor with double expansion shields or other method as approved by the engineer.

B. Where shown on the drawings, pipe bends shall be supported using concrete anchor posts. Pipes shall be securely fastened to concrete supports with suitable metal bands as required and approved by the engineer.

2.8 VERTICAL PIPE SUPPORTS

A. Where vertical pipes are not supported by a system as specified in part 2.8, they shall be supported in one of the following methods.

1. For pipes ¼” to 2” in diameter, an extension hanger ring shall be provided with an extension rod and hanger flange. The rod diameter shall be as recommended by the manufacturer for the type of pipe being supported. The hanger ring shall be galvanized steel or PVC clad depending on the supported pipe. The hanger ring shall be equal to Carpenter & Paterson Figure number 81 or 81CT. The anchor flange shall be galvanized malleable iron similar to Carpenter & Paterson Figure number 85.

2. For pipes equal to or greater than ½” in diameter extended pipe clamps may be used. The hanger shall be attached to concrete structures using double expansion shields or to steel support numbers using welding lugs similar to Carpenter & Paterson figure number 220.

3. Pipe riser clamps shall be used to support all vertical pipes extending through floor slabs. Riser clamps shall be galvanized steel similar to Carpenter &

Paterson figure number 126. Copper clad or PVC coated clamps shall be used on copper pipes. Insulation shall be removed from insulated pipes prior to installing riser clamps.

4. Unless otherwise specified, shown, or specifically approved by the engineer, vertical runs exceeding 11 ft, shall be supported by approved pipe collars, clamps, brackets, or wall rests at all points required to insure a rigid installation.

2.9 SPECIAL SUPPORTS

A. Pipe supports shall be provided for closely spaced vertical piping systems as shown on the drawings or as otherwise required to provide a rigid installation. The support system shall consist of a framework suitably anchored to floors, ceilings, and walls and as manufactured by the Unistrut Corporation, Globe-strut as manufactured by the Metal Products Division of U.S. Gypsum or equal.

B. Vertical and horizontal supporting members shall be U shaped channels similar to Unistrut Series P1000. Vertical piping shall be secured to the horizontal members by pipe clamps or pipe straps equal to Unistrut Series P1100M and Series P2558. All components shall be of mild steel.

C. The assemblies shall be furnished complete with all nuts, bolts, and fittings required for a complete assembly including end caps for all members.

D. The design of each individual framing system shall be the responsibility of the Contractor. Shop drawings, as specified above, shall be submitted and shall show all details of the installation including dimensions and types of supports. In all instances the completed frame shall be adequately braced to provide a complete rigid structure when all the piping has been attached.

E. Any required pipe supports for which the supports specified in this section are not applicable shall be fabricated or constructed from standard structural steel shapes in accordance with AISC Specifications, have anchor hardware similar to items previously specified herein, shall meet the minimum requirements listed below, and are subject to the approval of the engineer.

1. Pipe support systems shall meet all requirements of this section and all related sections of the specification.

2. Complete design details of the entire pipe support systems shall be provided for review by the engineer.

3. The pipe support system shall not impose loads on the supporting structures in excess of the loads for which the supporting structure is designed.

3.0 EXECUTION

3.1 DELIVERY AND STORAGE

A. All supports and hangers shall be crafted, delivered and uncrated so as to protect against any damage.

B. All parts shall be properly protected so that no damage or deterioration shall occur during a prolonged delay from the time of shipment until installation is completed.

C. Finished iron or steel surfaces not galvanized or painted shall be properly protected to prevent rust corrosion.

3.2 INSTALLATION

A. The Contractor shall furnish and install all structural supports, anchors, and hangers required for the suspension and placement of the piping required for this installation. Pipe hangers and supports shall be installed to allow for expansion and contraction and placed close fittings, valves, and heavy equipment. They shall be installed so that piping will be free from vibration, sagging, or movement other than that caused by heat expansion or contraction. Piping shall be pitched as specified in individual service specifications.

B. Piping shall be supported directly from the structure and not from the supporting systems or equipment of other trades.

C. Pipe may be supported by trapeze hangers and/or in tiers leaving sufficient room for installation of fittings, insulation, etc., and for future work or maintenance.

D. There shall be no cutting, drilling, or welding on the building steel except as shown on the contract drawings or as instructed by the Owner's rep.

E. Hanger rods shall be connected to beam clamps, concrete inserts, or expansion anchors. C clamps shall not be allowed. Offset suspension by hangers is not permitted.

F. Hanger rods shall be installed with double nut arrangement both at the lower end where the hanger is attached, and at the top where it fastens to the clamp or insert. Where rod sizes are not listed, the rod size shall confirm to the following table.

Pipe Size, in.	**Rod size, in.**
2 and smaller	3/8
2-1/2 to 3-1/2	1/2
4 and 5	5/8
6	3/4
8 to 12	7/8
14 and 16	1

G. Inserts shall be provided as specified elsewhere in this specification. When through bolts are used, plates or large washers shall be provided under the heads.

H. Piping related equipment (e.g., filters, meters) shall be located as shown on contract drawings or as instructed by the Owner's representative. All such equipment which must be secured to concrete walls, ceiling slabs, columns, other building masonry, and floors shall be attached by means of approved insert and/or fasteners as listed in this specification.

I. Maximum spans between hangers for straight horizontal runs of steel and copper pipe shall be in compliance with the following table:

Nominal Pipe Size (inches)	Maximum Span (feet)	Nominal Pipe Size (inches)	Maximum Span (feet)
1/2	5	4	14
1	5	6	17

1-1/2	8	8	19
2	10	10	22
2-1/2	11	12	23
3	12	14	25

Additional hangers shall be provided where concentrated weights such as valves or heavy fittings occur and where changes in direction of the piping system occur between hangers or as noted on the drawings.

J. Reduce spacing to a maximum of 10'-0" apart regardless of pipe size as necessary for fittings, valves, and other concentrated loads.

K. Hangers for horizontal lines shall be vertically adjustable to obtain pitch requirements indicated elsewhere in this specification.

L. Hangers and supports that are in direct contact with copper shall be copper-plated or plastic-coated to prevent any electrolytic reaction.

3.3 HANGER SUPPORT INSTALLATION

A. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulating pipe.

B. Fastener System Installation:

1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

C. Install hangers and supports to allow controlled thermal and seismic movement of piping systems to permit freedom of movement between pipe anchors and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

D. Install lateral bracing with pipe hangers and supports to prevent swaying.

E. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads including valves, flanges, strainers NPS 2-1/2" and larger, and at changes in direction of piping. Install Concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

F. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

G. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.

H. Insulated Piping: Comply with the following:

1. Attach clamps and spacers to piping.

    a. Piping operating above ambient air temperature: Clamp may project through insulation.

    b. Piping operating below ambient air temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.

    c. Do not exceed pipe stress limits according to ASME B31.1 for Power Piping and ASME B31.9 for Building Services Piping.

2. Install MSS Sp-58, type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

    a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4” and larger if pipe is installed on rollers.

3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.

    a. Option: Thermal hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4” and larger if pipe is installed on rollers.

4. Shield dimensions for pipe: not less than the following:

    a. NPS ¼” to NPS 3 ½”: 12” long and .048” thick.
    b. NPS 4”: 12” long and .06” thick.
    c. NPS 5” and NPS 6”: 18” long and .06” thick.
    d. NPS 8” to NPS 14”: 24” long and .075” thick.
    e. NPS 16” to NPS 24”: 24” long and .105” thick.

5. Insert Material: Length at least as long as protective shield.

6. Thermal-hanger Shields: Install with insulation same thickness as piping insulation.

3.4 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

C. Provide lateral bracing to prevent swaying for equipment supports.

3.5 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1 procedures for shielded metal arc welding,

appearance and quality of welds, methods used in correcting welded work, and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. Finish welds at exposed connections so no roughness shows after finishing and contours of welded surfaces match adjacent contours.

3.6 ADJUSTING

A. Hanger adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length if continuous threaded hanger support rods to 1-1/2”

3.7 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Touch Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint of miscellaneous metal are specified in Division 9 painting sections.

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

+ + END OF SECTION 233500 + +

TABLE OF CONTENTS

1.0 GENERAL

A. It is the intent of this specification to provide the Contractor with the necessary information to enable him to provide the HVAC piping systems as noted herein. These items shall be the Contractor's standard design modified as required to meet the operation and design requirements given herein and in the attached Specifications and Contract Drawings.

B. Compliance with the specification does not relieve the Contractor or manufacturer from the responsibility to furnish piping system of proper design and construction suitable for all operational conditions.

1.1 SCOPE OF WORK

A. The Contractor shall furnish labor, supervision, tools, equipment and materials for the HVAC piping work as per Division 15 Specifications and the Contract Drawings.

B. The Contractor shall furnish and install all new chilled water and make-up water piping and piping accessories as shown on the drawings and as described in these specifications.

C. This Contractor shall include the following work:

1. Demolition of existing piping systems as shown on the drawings.

2. Furnish and install all chilled water, condenser water and cold water make-up piping and valves as shown on the drawings.

3. Mechanical contractor shall be responsible for all concrete core drilling and saw cutting required for the installation of the new piping systems.

4. Mechanical contractor shall provide for the expansion and contraction of the piping system.

D. The Contractor is responsible for all shop and field fabrication, field erection, rigging, installation, pressure testing, and documentation of the HVAC piping systems.

E. The Contractor shall coordinate closely with the ATC Contractor and all other trades.

F. All new HVAC control valves shall be supplied by the ATC Contractor and installed by the Piping Contractor.

G. The Contractor shall provide all start-up services required by the specifications.

H. The Contractor shall flush, clean and test all new chilled water piping as stated in this specification.

I. All fabrication shall be in accordance with the applicable sections of the latest edition of the ANSI/ASME Codes, specifically B31.9 “Building Services Piping.”

J. All piping systems installed under this contract are to be labeled with piping service codes.

K. All valves and instruments installed under this contract are to be tagged.

L. All installation activities will require coordination with other Contractors, including the General Contractor and the Owner.

M. Where not fully called for in the contract documents, design of hangers and supports shall be the Contractor's responsibility. Design shall conform to accepted engineering practice, using factor of safety or 2-1/2.

N. Shutting and draining down of the existing domestic cold water system as needed for new make-up water systems as indicated on the documents.

O. Shutting, draining and re-filling of the existing chilled water and condenser water systems as needed to disconnect and reconnect to the new chiller plant piping system.

P. Provide domestic components (non-foreign), acceptable by state standards, approvals throughout and Engineer of Record.

1.2 REFERENCE DOCUMENTS

A. CODES AND STANDARDS

1. All piping systems shall meet the requirements of the latest applicable ASME, ANSI, and ASTM Codes.

B. CONTRACT DRAWINGS

1. The Owner is responsible for the accuracy of supplied contract drawings and the Contractor is to install the piping systems to reflect the configuration, dimensions, elevations, slope requirements, pipe insulation and pipe supports as indicated on contract drawings.

2. It is the responsibility of the Contractor to, upon review of contract drawings and existing site conditions, notify the construction manager, prior to any relative fabrication or installation, of any problems or situations requiring modification to piping as indicated on contract drawings.

1.3 SUBMITTALS

A. The Contractor shall submit shop drawings for all equipment, piping systems, and product data for all piping fittings, valves and specialties. Include maintenance data for hydronic specialties, special duty valves to include in the Operation and Maintenance Manual specified in 61562-15000 "HVAC General Requirements".

B. All materials submitted should not be procured until reviewed and approved by the engineer of record.

C. The Contractor shall be responsible for including all piping information on the coordination drawing.

D. All submittal procedures shall be as specified in 61562-15000 "HVAC General Requirements".

E. Piping layout drawings (1/4" = 1'-0") showing proposed pipe routing with elevations, sections and 3D isometrics clearing indicating the installation intent. Layout shall show all expansion compensation supports, anchors and guides.

F. Manufacturer's Data Sheets on all catalogued pipe supports being used.

G. Drawings covering all specially designed hanger assemblies and fabrications.

H. Piping Isometrics showing bill of materials, valves, and pipe cut lengths for hook-ups to equipment.

1.4 QUALIFICATION OF WELDING

A. Qualifications of the welding procedures to be used and the performance of welders and welding operators shall be in accordance with ASME B31.9 except as follows:

1. Copies of the applicable welding procedure specifications including the Procedure Qualifications Records (PQR), along with the welder/welding operator qualification test records and certificates, shall be submitted by the Contractor to the Owner or Owner's Representative for record at least (5) business days prior to performing any welding work.

2. Welder and welding operator performance qualification from other employees is not acceptable.

B. The Owner's representative shall be notified 24 hours in advance of tests.

C. Welders or welding operators shall apply their assigned symbols near each weld they make as a permanent record.

D. A fire watchman with an approved fire extinguisher shall be posted at the site of the welding work, during that work, and for a minimum of 30 minutes after the work is completed, to see that sparks or drops of hot metal to cause a fire.

E. All welding in the occupied areas shall be done after school hours during the week. Smoke detectors shall be covered and protected from false alarming for any welding done while the building is occupied.

1.5 WELDING REQUIREMENTS

A. All welds in pressure piping (and all welds to pressure piping for structural attachments) shall be in accordance with ASME B31.9 and the following:

1. The weld at the perimeter of branch connection reinforcing pads shall be a continuous full fillet weld unless otherwise approved by the Owner or Owner's Representative.

2. Ends of valves and unions of socket welding construction shall be welded by an electric arc process to minimize distortion.

3. Valves shall be closed during welding.

4. Non-metallic valve seats shall be removed during welding unless otherwise stated in the manufacturer's literature.

5. Welding on piping systems shall be performed using the Shielded Metal Arc Welding (SMAW) process. The weld procedure and welder qualification shall specify which process will be used.

6. The Gas Metal Arc Welding (GMAW) process and the Flux Cored Arc Welding

(FCAW) process may be used if specifically approved by the Owner or Owner's Representative.

7. The Submerged Arc Welding (SAW) process may be used in the shop for automatic machine welding operations if specifically approved by the Owner or Owner's Representative.

2.0 PRODUCTS

2.1 PIPING AND FITTINGS

A. General:

1. Pipe materials and fitting materials shall be as indicated in Schedule of Pipe and Fitting Materials. Provide dielectric fittings to connect different piping materials.

2. Provide unions for threaded end valves to facilitate removal from pipe.

3. All materials shall be in accordance with the Piping Material Specifications table. In this specification.

4. All material shall be new, unused, and free of defects and imperfections, and shall be supplied in strict accordance and with the applicable Piping Material Specifications. All materials shall be domestic in nature no substitutions are permitted without written consent from the engineer of record.

5. Mechanical piping, fittings, and appurtenances shall be domestic in origin. Foreign manufacturers shall not be allowed unless otherwise specified.

6. All pipe, fittings and valves shall be supplied marked by the manufacturer in accordance with the marking sections of the standards to which reference is made in the Piping Material Specifications, or in accordance with the requirements of MSS SP-25: "Standard Marking System for Valves, Fittings, Flanges and Unions of the Manufacturers Standardization Society of the Valve and Fitting Industry."

7. All material items shall be carefully inspected upon receipt at the jobsite. The Contractor shall examine all components for compliance with the applicable material class specification, ASTM identification and markings, purchase order compliance including shortages, and over shipments and any damaged or flawed items (i.e. scarred flange faces, bent pipe, damaged threads, beveled ends, etc.), and shall report his findings to the Site Engineer. Items failing to meet this criteria shall be rejected and held in a separated area for disposition.

8. Pipe in sizes 24" and smaller shall conform dimensionally to ANSI B36.10 for carbon steel, and ANSI B36.19 for stainless steel. Pipe wall thickness shall be as indicated in the Piping Material Specifications.

9. All steel screwed and socket welding fittings shall conform to ANSI B16.11.

10. All carbon steel butt-welding fittings shall conform dimensionally to ANSI B16.9, with wall thickness at least equal to that of the pipe on the same service. Where the fitting is heavier than the pipe, ends of fittings shall be beveled to meet code requirements.

11. Mitered joint elbows and field fabricated reducers are not permitted unless approved by the Engineer of Record.

12. Grooved and pro-press piping systems are NOT Acceptable. All piping to be welded or soldered as specified.

B. Chilled Water, Condenser Water and Non-Potable Water Piping Materials (Copper)

Item	Size	Description	Remarks
Tubing	1/4" thru 2 1/2"	Copper ASTM B-88 seamless hard drawn Type "L" plain ends	Note 3
Type of Joint	1/4" thru 2 1/2"	Copper solder joints	
Fittings	1/4" thru 2 1/2"	Copper ASTM B-75 wrought solder joint pressure type ANSI B16.22 copper tubing ends	Note 1
Unions	1/4" thru 2 1/2"	Copper ASTM B-75 solder joint tubing ends integral seats ANSI B16.22	Note 4
Flanges	1/4" thru 2 1/2"	Copper ASTM B-62 solder joint ANSI B16.22 150# drilling Flat face ANSI B16.24	
Gaskets	1/4" thru 2 1/2"	1/8" ring gasket type 316 SS spiral wound Approved Gaskets: Flexitallic style CG with super flexite filler (Use FF gaskets with FF flanges)	
Solder		ASTM B-32 Grade Sb5; Tin 94.0 min, Lead 0.20, Antimony 4.5-5.5	
Thread Sealant		Teflon ribbon 1/2 " wide x 4 mils thick	
Bolts		Machine Bolts - Carbon Steel ASTM A-307 Grade B; Thread ANSI B1.1 Class 2A; Heavy Hex Nuts - Carbon Steel ASTM A-563 Grade A; Thread ANSI B1.1 Class 2B	Note 4

Notes:

1. Provide dielectric fittings between ferrous and copper piping.

2. Copper tubing shall be mill degreased and furnished with end caps.

3. To avoid seizing of bolts and unions, use Chesterton "785" anti-seizing compound

4. Use cadmium plated bolts and nuts for outdoor installations. Bolts shall be installed with dielectric sleeves and washers at both ends.

C. Chilled Water & Condenser Water Piping Materials (Steel)

Item	Size	Description	Remarks
Pipe	1/2" thru 2"	Carbon steel standard weight ASTM A-106 Grade B threaded & coupled ANSI B1.20.1	
	2-1/2" thru 24"	Carbon steel standard weight ASTM A-106 Grade B Seamless standard weight domestic steel beveled ends	
Type of Joint	1/2" thru 2"	Screwed NPT	
	2-1/2" thru 36"	Butt welded	
Fittings	1/2" thru 2"	Malleable iron ASTM A-197 150# ANSI B16.3 screwed ends black	
	2-1/2" thru 36"	Carbon steel ASTM A-234 WPB standard weight ANSI B16.9	
Nipples	1/2" thru 2"	Carbon steel ASTM A-106 Grade B Schedule 80 threaded both ends	
Unions	1/2" thru 2"	Malleable iron 300# class ASTM A-197 bronze to iron seats	
Flanges	1/2" thru 2"	Screwed forged steel ANSI 150# class ASTM A-105 raise face ANSI B16.5	
	2-1/2" thru 36"	Weld neck forged steel ANSI 150# class ASTM A-105 standard bore raised face ANSI B16.5	
	Exception:	Use flat face flanges when mating with flat faced flanges on valves or equipment	
Gaskets	1/2" thru 36"	1/16" thick ANSI 150# ring type compressed synthetic fiber with SBR binder (Use FF gaskets with FF flanges) Approved Gaskets: Garlock "Blue Gard" Style 3200 Chesterton 195	
Thread Sealant		Teflon ribbon 1/2" wide x 4 mils thick	
Bolts		Machine Bolts - Carbon Steel ASTM A-307 Grade B; Thread ANSI B1.1 Class 2A; Heavy Hex Nuts - Carbon Steel ASTM A-563 Grade A; Thread ANSI B1.1 Class 2B	
	Exception:	Use cadmium plated bolts and nuts for outdoor installations	

Notes:

1. To avoid seizing of bolts and unions, use Chesterton "785" anti-seizing compound.

2. Sealant requirement for plug valves should be referred to manufacturer suggested formula.

2.2 VALVES AND STRAINERS

A. General

1. All valves and piping accessories, at a minimum, shall be equal to existing material and methods.

2. Valves shall have name of manufacturer and guaranteed working pressure cast or stamped on bodies. Valves of similar type shall be by single manufacturer. Valves 3" and larger shall be provided with chain operators when 7'-0" or higher above finish floor.

3. All valves for exterior use shall have an epoxy coating.

B. HVAC Valves:

1. Isolation Valves (2 ½" and smaller), Ball Type:

a. 600 psi WOG rating; body to be bronze ASTM B-61; trim to be hard chrome plated bronze ball and stem; seats and seals to be RTFE (Reinforced Teflon); screwed NPT ends; blow out proof stems with 2-1/4" stem extensions (insulated systems); 150 psig rating at 366˚F. Approved Vendors shall be Milwaukee, Apollo or Stockham.

2. Isolation Valves (3" and up) Butterfly Type.

150 psi CWP rating; body to be cast iron ASTM A-126 Class B threaded lug pattern; aluminum/bronze ASTM B-148 alloy 954 disc; stem to be 316 stainless steel; bushings to be bronze ASTM B-438 Grade 1 Type 1; seat to be EPDM replaceable type Phenolic backed; Knotched Plate Lever Operator with memory stop and extended neck for 2" of insulation. Worm Gear operator for valves 4" and larger. Approved Vendors shall be Milwaukee, Apollo or Stockham.

3. Drain Valves:

a. Valves shall be 3/4" angle style with bronze body, bronze solid wedge, inside screw, now rising stem, and hose thread with cap and chain. Approved Vendors shall be Milwaukee, Apollo or Stockham.

4. Check Valve (2 inches and up)

a. Class 125 swp, 200 psi WOG wafer type; cast iron body ASTM A-126 Class B; bronze or aluminum bronze disc; seat to be Buna-N; dual disc non-slam with 316 stainless steel spring and hinge pin. . Approved Vendors shall be Milwaukee, Apollo or Stockham.

C. "Y" Type Strainers for exterior use :

1. Strainers shall be full size of entering pipe size and have a maximum clean pressure drop of one psi. Strainers shall be as manufactured by Sarco, Mueller, Watts, IFC or Armstrong.

2. Provide blow-off valve on each “Y” strainer with plug.

3. 200 psi WOG; cast iron body ASTM A-48 Class 30 “Y” pattern; 125# flanged ends; self cleaning.

   a. Provide 1/8” perforated SS screen for the “y” strainers as indicated on Contract Drawings.

4. Design supports high enough to allow for pulling of strainer.

D. Basket Type Strainers for exterior use :

1. Basket strainer shall be a 200 psi WOG A126-B cast iron body; 125# flanged ends; A516-70 steel plate top access cover; equal to IFC Yoke Cover Basket Strainer

   a. Provide 1/8” perforated 304 SS screen for the basket.

2.3 HYDRONIC SPECIALTIES

1. Acceptable Manufacturers (unless otherwise noted):

   1. TACO, Inc.
   2. Bell & Gossett
   3. Armstrong Pumps, Inc.
   4. Tour & Andersson (Only Acceptable Vendor for Balancing Valve)

2. Manual Air Vent:

   1. Bronze body and nonferrous internal parts: 150-psig working pressure, 225 deg F operating temperature; manually operated with screwdriver or thumbscrew; with 1/8-inch NPS discharge connection and 1/2-inch NPS inlet connection.

3. Automatic Air Vent:

   1. Designed to vent automatically with float principle: bronze body and nonferrous internal parts; 150-psg working pressure, 240 deg F operating temperature; with 1/4-inch NPS discharge connection and 1/2-inch NPS inlet connection.

4. Pressure/Temperature Plug:

   1. Provide nickel-plated brass body test plug in 1/2" fitting, plug shall be rated for 500 psig minimum with 2 self sealing valve types suitable for inserting a 1/8" outside diameter probe from a dial thermometer or pressure gage provide with gasketed and threaded cap with retention chain. Plug shall be Flow Design Inc. or H.O. Trerice Co.

   2. Provide one carrying case containing one (1) thermometer (30 to 300° F scale) and one (1) pressure gauge (0 to 60 psi scale) compatible with the pressure/temperature plugs specified above. Deliver case to construction manager.

   3. Thermowells for all services shall be made of stainless steel.

4. Provide 2” port extension kits to extend out above pipe insulation.

5. Balancing Valves (No other Vendors are acceptable)

1. Balancing Valves (2 inches and smaller):

a. Provide circuit setter calibrated balancing valves. Valves shall be bronze body, brass ball construction with glass and carbon filled seat rings. Valves shall have readout ports, drain/purge port and memory stop feature. Valves shall have threaded connections. Valves shall be equal to Tour & Andersson Model STAD. Provide with 2” extensions on balancing ports to clear insulation. Provide with manufacturers removable pre-fab insulation covers for installation by the insulation sub contractor.

2. Balancing Valves (2-1/2 inches and larger):

a. Valves shall be of cast iron body, flanged 125 psi ANSI flanged connections suitable up to 175 psi working pressure. Valves 2-1/2" to 3" shall have a brass ball with glass filled TFE seat rings. Valves 4" to 8" shall be fitted with a bronze seat, replaceable bronze disk with EPDM seal insert and stainless steel stem. Valves shall have readout ports with 3” extension stems, drain/purge port and memory stop feature. Valves shall have solder connections. Valves shall be equal to Tour & Andersson Model STAF-SG. Provide with manufacturers removable pre-fab insulation covers for installation by the insulation sub contractor.

3. Provide schedule full all balancing valves indicating size and flow rate. Balancing valves shall be sized to handle the flow range indicated on the contract documents.

2.4 INSERTS, ANCHORS AND BEAM SUPPORTS

A. Where support rod sizes exceed 7/8" diameter or where the load exceeds the recommended load for the insert or anchor, use two inserts or anchors with a trapeze-type connecting member below the concrete.

B. Where installation can be made before the concrete is poured, use Figure 650 or 650N.

C. Where installation is made after the concrete is in place, use Phillips "Red Head" expansion anchors, Rawl Studs, Rawl self-drilling anchors, Hilti Kwik-Bolts.

D. Plastic, lead or fiber screw anchors, lag screws and expansion shields are not acceptable.

E. Where continuous inserts are required, they shall be Unistrut or approved equal, formed from not less than 12 gauge galvanized steel with anchors spaced on not less than 6" centers, and with end caps, splice plates, bolts and nuts as required by conditions. In rooms with defined environmental requirements, more sanitary provisions must be made as called for on the drawings or elsewhere in these specifications.

F. For attachment to beams, use Figures 82, 217, 268, 297, 314 or 702.

2.5 PRESSURE GAUGES AND THERMOMETERS

A. Pressure gauges shall be Ashcroft Duragage, Trerice 500X series or U.S. Gauge, 4½ inches in diameter, cast aluminum case, screw driver pointer adjustment, stainless steel movement, and bronze bourbon tube. Provide fittings and ball valves at gauges and fluid fill.

B. Thermometers shall be Trerice Model B856 5" diameter, stainless steel case and stem, bimetallic, silicone dampened coil, adjustable angle with external reset. Provide with appropriate stem length to clear 2” of pipe insulation thickness and stainless steel thermowell.

C. Scale Ranges

1. Thermometers

b. 0 to 100 deg F with 2 degree scale divisions for chilled water and condenser water services.

2. Pressure Gauges

a. Discharge and inlet side of pumps 0 to 100 psi
b. Inlet side of condenser water pumps : 30” hg to 60 psi

2.6 WELDING MATERIALS

A. Welding materials shall be restricted to those materials referenced in the approved welding procedures and which are recognized in the various ASME/ANSI Codes (i.e. B31.9 and Section IX).

B. For carbon steel welding (P-Number 1) the base materials shall be restricted to wrought or cast forms which have a specified tensile strength of 70 KSI or less.

C. Backing rings, strips, and consumable inserts are not permitted without prior approval by the Owner or Owner’s Representative and then only if there is a qualified welding procedure using them.

3.0 EXECUTION

3.1 PREPARATION

A. The Contractor shall carefully review the engineering drawings of all disciplines, and check for obstructions and interferences. This shall be done during the bid period and prior to proceeding with installation to avoid unnecessary rework later on. In addition, the Contractor shall become familiar with the drawings and make note of locations where walls, partitions, ceilings, structural members, etc., are called to be closed-in or to be furred. He shall coordinate this work with other contract trades to avoid interferences or delays in construction.

B. Any questionable information in the specifications and/or on the plans, or conflicts with codes, shall be called to the attention of the Engineer of Record for clarification before

proceeding with fabrication or erection of the parts affected. If, in the opinion of the Contractor, any additional detail drawings are necessary, he shall prepare them at his own expense, together with all bills of material.

3.2 ARRANGEMENT AND ALIGNMENT

A. Arrange and align all piping in accordance with the drawings. Elevations as given must be held. Floor elevations where given are to high points of floor. Dimensions must be held as closely as possible. Field check all dimensions for accuracy before pipe is fabricated.

B. Install all piping straight and as direct as possible, generally forming right angles with, or running parallel with, walls or adjacent piping. All piping shall be neatly spaced, with risers and drops running plumb and true.

C. Drawings are generally made to scale. Piping and equipment are located in the drawings by dimensioning their center lines to building columns, and/or to other pipes, and by giving center line or bottom of pipe elevations, or, in the case of underground piping, by the invert elevation. In order to clarify the work, however, some of the piping may be shown on the Owner's drawings slightly out of place, in which case sufficient dimensions are given to indicate the desired arrangement. The Contractor shall use figured dimensions and elevations to prepare his shop and spool drawings. All dimensions shall be checked in the field by the Contractor before final connections are fabricated.
NOTE: Do not scale drawings.

D. Drawings showing piping 1-1/2" and smaller are in general diagrammatic and the exact location of these lines shall be determined by the Contractor from field measurements taken by him. The actual arrangement of the small size piping, when erected, shall follow the general locations shown on the drawings as far as practicable. The installation made in this way shall be neat in appearance and convenient to operate, and shall provide for appropriate expansion and drainage.

E. Coordinate installation of piping systems with other work and/or with existing facilities, to avoid blocking building openings, light fixtures, etc. Piping shall not interfere with access to valves or equipment and shall not obstruct passageways. In general, minimum headroom clearance shall be considered as 7'-0" clear under all piping, coverings, and appurtenances. Piping shall be installed with sufficient clearance for operation, inspection/ replacement of valves, etc.

3.3 GENERAL

A. Install all piping systems for expansion and/or contraction under start-up, operating, shut-down, and steam-out conditions, without overstressing piping, valves or equipment. Pipe anchors, guides, hangers and supports shall be provided as required.

B. Install anchors where shown on the plans. Furnish guides on each side of all expansion loops, off-sets, swing joints and expansion joints whether or not detailed on the plans.

C. Cold springing of the pipe, where indicated on the drawings, shall be done with anchors, hangers and sliding supports in place.

D. Piping which is furnished as part of packaged equipment shall conform to the requirements of this specification and the applicable Piping Material Specification.

E. The Contractor, prior to fabrication in the shop or the field, shall remove all the loose rust, scale and foreign material from inside the pipes. The Contractor shall use power or

manual brushes and/or grinders to clean the inside of the pipes prior to erection and connection to other piping and/or equipment.

F. Special precaution shall be taken at all times during fabrication and erection to prevent entrance of any foreign matter into piping or equipment.

G. Open end of pipes shall be plugged after fabrication. All openings in pipe or equipment left overnight or for future connection shall be covered to keep foreign particles out of the system. A plastic type plug or cap should be used for temporary protection. Rags or waste are not to be used because they will deposit lint in the openings.

H. System components which require observation, operation or maintenance (such as valves, traps, gauges, controls, strainers, dirt pockets, cleanouts, unions and flanges, etc.) shall be located to be readily accessible. They shall not be concealed in chases or above ceilings without provision for access. Valves which require frequent operation, or which may require emergency operation, and are not accessible from normal working level, should be installed with appropriate provisions such as chain wheels, extension stems, ladders or platforms. If the plans fail to meet this requirement of accessibility, the discrepancy shall be called to the attention of Engineer of Record for clarification prior to fabrication or erection.

I. Provide all pipe openings through walls, partitions and slabs with sleeves having an internal diameter at least 1" larger than the outside diameter of uninsulated pipes or of the insulation for insulated services. When pipe is fitted with restraining rods, the sleeve shall be oversized to accommodate the rods. Holes for sleeves in existing buildings are to be neatly cut.

J. Install sleeves through interior walls and partitions flush with finished surfaces; sleeves through outside walls are to project 1/2" on outside of the finished wall. Floor sleeves are to project 2" above finished floors.

K. Set sleeves in place before pouring concrete or securely fasten and grout in with cement.

L. Sleeve Construction:

1. Interior Partitions: No. 22 gauge galvanized sheet steel with soldered joint.

2. Interior Masonry Walls and Floors: Standard weight galvanized steel pipe, or stainless steel where shown on drawings.

3. Exterior Walls: Standard weight galvanized steel pipe.

M. Sleeve Caulking:

1. Interior walls and floors: Fill the space between outside of pipe or insulation and the inside of the sleeve, or framed opening, with fiber glass, seal both ends with expanded foam.

2. Exterior walls (above ground): Pack with oakum, seal with lead and watertight mastic or asphalt; or install a modular mechanical seal "Link-Seal" as manufactured by the Thunderline Corporation.

3. Exterior walls (underground): See section 3.4.13.

4. Fire Rated walls and floors: Run pipe through a sleeve 1" larger than the outside diameter of the pipe or insulation (if insulated pipe is called for). The insulation shall be fire resistant. Fill space between the sleeve and the pipe completely with fiberglass wool and grout the ends. When pipe penetration will be exposed to view an escutcheon plate shall also be furnished and installed.

N. Any existing floor sleeves which are being abandoned as part of this work are to be cut off flush and plugged watertight.

O. Provide escutcheons on both sides of wall, floor, ceiling, and partition penetrations for all pipes exposed to view in finished areas, whether or not insulated, unless otherwise shown on the drawings. For pipes passing through floors, escutcheons shall fit over the sleeves. Escutcheons plates shall be stainless steel or chrome plated and fabricated in one piece.

P. Roof Caulking: Provide caulking, sealants, compressible fillers, flashings and/or rain covers as detailed on the architectural drawings. Coordinate work with roofing contractor.

Q. Additional Requirements

1. Provide blow-off valve on each strainer.

2. Provide air vent at each high point and drain valve at each low point for complete system drainage.

3. Provide unions for threaded end valves to facilitate removal from pipe.

4. Install dielectric nipples or unions between dissimilar metals.

5. Route piping in an orderly manner and maintain proper grades. Install to conserve headroom and interfere as little as possible with use of space. Run piping parallel to walls. Group piping whenever practical at common elevations. Install concealed pipes close to building structure to keep furring to a minimum.

6. Slope water piping 1 inch in 40 feet (1/480) and arrange to drain at low points.

7. Install piping to allow for expansion and contraction without stressing pipe or equipment connected.

8. Provide clearance for installation of insulation and for access to valves, air vents, drains and unions.

9. Piping containing liquid shall not be installed above light fixtures, bus duct or other electrical devices and shall not pass through or above ceiling of Electrical Rooms, Elevator Equipment Rooms and Telephone Rooms.

10. Remove all newly installed strainers and clean and reinstall strainers before final acceptance of system.

11. Leave at least one inch clearance between surface of pipe, flange, fittings, or insulation and adjacent wall or other building structure.

12. Leave piping systems clean and in condition to receive pain or insulation.

13. Make reductions in horizontal pipes with eccentric reducer fittings. Install with flat on top for water systems and flat on bottom for steam systems.

14. All pipe elbows shown on drawings shall be long radius type.

15. Ream Pipes after cutting and clean before installing. Cap or plug equipment and openings during construction. All open ended pipes shall be capped sealed at the end of the day.

R. Connections:

1. Provide eccentric reducing couplings to bring pipes flush on top for water service.

2. Nipples shall be same material, make and thickness as pipe with which they are used. Close nipples shall not be used.

3. Make piping connections 2" diameter and smaller to valves and equipment with 300 psi brass seat unions on steel piping and with heavy semi-flushed brass unions on copper tubing.

5. Make screw joints tight with Teflon (Polytetrafluoroethylene) tape for water or ligharge-glycerin mixture for steam applied to male threads. Use tapered threads.

6. All connections to mains with exception of low point drains and drip legs shall be made at the top of the pipe.

7. Provide swing joint elbows as needed to allow for pipe expansion.

3.4 INSTALLATION - ABOVEGROUND PIPING

A. Provide unions or flanges at all piping connections to coils, equipment, control valves, pressure reducing valves, steam traps, etc., at all locations as shown on the drawings, and generally as required to disconnect piping from equipment and apparatus. Arrange connections so that the equipment served may be removed without disturbing the piping. Where valves serve to isolate equipment or specialties, the unions or flanges shall be located between valves and equipment or specialties. Unions shall generally be used for pipe sizes 2" and smaller, and flanges for pipe sizes 2-1/2" and larger.

B. Unless otherwise shown on the plans, install all piping to coils, pumps and other equipment including valves and strainers therein, at line size. If a reduction is required at a pump or control valve, the reducer shall be installed abutting the inlet and/or outlet of the pump or valve. Piping at pump and driver nozzles shall be arranged to permit removal of pump or driver without removing block valves.

C. Piping shall not be covered or closed in until completion of the piping cleaning, testing and until the installation is approved by the Engineer of Record. Piping that has been covered or concealed without cleaning, testing and approval, shall be exposed at the contractor's expense.

D. Flanges:

1. As piping is being installed and after it is positioned and pressure tested, all flanges and connections to mechanical rotating equipment (i.e., centrifugal compressors, pumps, turbines, etc.) shall be unbolted and checked for alignment. Flanges shall be parallel within 1/64 inch per foot of flange diameter and shall not put any strain on equipment casings. Dial indicators shall be utilized to insure

strain free piping to equipment casing connections. All the work described above, reconnection and any corrective work, shall be done at the Contractor's expense.

2. Except for removable sections of pipe and for piping requiring dismantling for cleaning, use of companion flanges in piping shall be limited to connections at flanged equipment. Field joints may be flanged construction where expedient and economical to avoid field welding of joint requiring heat treatment and examination.

3. The location of flanged joints are shown on piping drawings. Bolt holes of flanges shall straddle the center lines of pipe unless otherwise shown and noted on drawings. Each piping material specification describes the type of flanges to be used and gives the rating, material, facing, etc. When a different type of flange is used, its location and description is shown on the drawings.

4. Blinds shall be provided as indicated on piping drawings and Piping and Instrument Diagrams. Material shall be the same as the piping in the line where it is used. Blinds shall be accessible from grade or platforms.

5. All orifice flanges shall be welding neck type, ANSI Class 300 minimum rating, and 2" minimum pipe size. Orifice plates shall be 1/8" thick for lines 12" and smaller, and 1/4" for lines 14" and larger, unless otherwise noted. The preferred installation of orifice flanges is in a horizontal line.

E. Piping:

1. All assembled piping shall be worked in place without springing or forcing, except as specified on the drawings, to properly clear all openings and equipment. All piping shall be installed to permit free expansion and contraction without damage to joints, hangers, or to insulation where it is applied.

2. All piping shall be erected and supported in a manner that will not put undue strain on pumps, tanks, or equipment. Cutting or other weakening of the building structure to facilitate piping installation will not be permitted.

3. Install piping with minimum clearance of at least one inch between extreme projections of piping, flanges, fittings, valves, etc., to allow for insulation, pipe expansion and the like.

4. Full lengths of pipe shall be used wherever possible. Short lengths of pipe with couplings or welds will not be permitted. After cutting pipe, ends shall be reamed and cleaned to eliminate foreign matter and burrs.

5. Lines shall not be extended by means of a dead end branch for the purpose of providing support.

6. Long radius elbows shall be used wherever possible.

7. Reductions in line size shall be made with butt-welding reducers, swage nipples, screwed or socket weld reducers. Do not use bushings.

8. Use eccentric reducing fittings or eccentric reducing couplings where required to prevent pocketing of liquid or non-condensibles.

9. Eccentric reducers with the straight side on top shall be installed, when required, on suction side of pumps. Eccentric reducers with the straight side on the bottom shall be installed on pipe racks.

10. Make all branch connections with tees, except that on steel piping, forged steel "Weldolets," "Sockolets" or "Threadolets" as manufactured by Bonney Forge may be used when the branch pipe is smaller than one-half the size of the main pipe (nominal sizes).

11. Where a line with lower rating connects to pipe or equipment with a higher rating, it shall take the higher rating to and including the first block valve, block and check valve, or to and including the second valve when double block valves are used. For alloy lines, the alloy material may terminate with the first valve.

12. In some cases the process or user may require different materials for final isolating valve and terminal piping between final valve and equipment. If there are any questions in this respect, the contractor shall verify with the Engineer of Record before installing valve and piping.

F. Instruments:

1. Instrument connections on piping and equipment such as local mounted pressure and temperature instruments, gage glass and level controls, shall be accessible from grade, platforms or ladders.

2. Instruments (i.e. pressure gauges, thermometers, orifice plates, etc.) are shown on the drawings in their approximate locations. Exact location shall consider visibility and any special installation requirements, and shall be as approved by Engineer of Record. Any relocation required because Contractor failed to obtain approval shall be done at Contractor's expense.

3. Furnish and install 1/2 inch size, 3,000 lb., forged steel weldolets, threadolets, elbowlets or weld couplets with nipples and root valves for all the pressure measuring instruments to be mounted in the piping systems, as shown on the Piping and Instrument Diagrams. Nipples shall be long enough to clear the pipe insulation. Fittings, nipples and valves shall comply with the Piping Material Specification of each piping system.

4. Furnish and install 3/4 inch size 3,000 lb., forged steel weldolets, threadolets, threaded elbowlets or threaded weld couplets for the thermowells for all the temperature measuring instruments to be mounted in the piping systems, as shown on the Piping and Instrument Diagrams.

5. The length of the thermowells shall be at least half the diameter of the pipe in which they are to be inserted up to a maximum of 6 inch in length. The thermowells shall be furnished with lagging extensions to clear the insulation in the piping systems. Thermowells for all services shall be made of stainless steel.

G. Vents and Drains:

1. Vents and drains shall be provided for the piping and equipment as indicated on the Piping and Instruments Diagrams and on the physical drawings. Vents and drains shall also be provided, in addition to those shown on the drawings, when the arrangement of the piping results in high and low points that cannot be vented or drained through connections shown.

2. Each drain point shall have a valve and a capped nipple. Unless otherwise shown on the drawings, the size of the drains shall be:

Pipe Size	Drain Size
Headers 2" and smaller	1/2"
2-1/2" thru 4"	3/4"
6" thru 16"	1-1/2"
18" and larger	2"

3. All drains shall be run to the nearest floor drain. All drains emptying into floor drains or open hubs shall terminate at a point one drain line inside diameter, but not less than 2 inches and not more than 4 inches, above the top of the floor drain or hub.

Inside a diked area furnished with a floor or hub drain, the pipe shall be terminated as described before, above the top of the dike. The end of a pipe discharging into floor drains or hub drains, shall be cut at 45°.

4. Manual vents shall have a 1/2" valve for headers 16" and smaller, and a 1" valve for 18" and larger, and shall be piped to a floor drain, or arranged so that blow-off water can be caught in a bucket. Automatic air vents, where used, shall be installed with 1/4" tubing to a suitable drain.

5. Pump casing vents and drains shall be provided as shown on Piping and Instrument Diagrams.

6. Sample connections shall be 3/4" size and be made either on top or side of main line, never on the bottom.

Sample lines shall be as short as possible.

3.5 FABRICATION - CARBON STEEL

A. Fabrication of all piping systems shall be in accordance with the Code for Pressure Piping ANSI B31.3; with the exception of steam, condensate, boiler feed water and pumped condensate piping that shall be fabricated in accordance with the Code for Pressure Piping ANSI B31.1

B. All welding shall be accomplished using welding procedure specifications and welders/welding operators which have been qualified in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualifications."

C. Copies of the applicable welding procedure specifications, including the procedure qualification records (PQR), along with the welder/welding operator qualification test records shall be submitted to the Engineer of Record for approval prior to performing any work.

D. All welding performed by the Contractor or fabricator shall be visually inspected to assure compliance to the requirements of the applicable code or standard, (e.g., ASME Section I, ANSI B31.1 or ANSI B31.3).

E. Other nondestructive testing, such as radiographic, magnetic particle or liquid penetrant examination, shall be performed as required by the applicable code, or engineering design specification.

F. The Engineer of Record reserves the right to inspect work performed by the Contractor/Fabricator at any time during the manufacturing or erection process. If, as a result of this inspection, a certain welder's work is frequently rejected, DOC will require that the welder be removed from this work and that all work performed by that welder be inspected until the Engineer of Record is satisfied that the quality of the welder's work meets the requirements of the applicable code, standard, or engineering design specification.

G. Any welds found defective as a result of field inspections, shall be replaced at no cost to RWU.

H. Base Materials: For carbon steel welding the base materials shall be restricted to carbon steels, wrought or cast forms, which have a minimum specified tensile strength of 70 KSI or less, and which are found in the following codes and tables:

Codes	Tables
ANSI B31.1	Appendix A Table A-I Carbon Steel
ANSI B31.3	Appendix A Table I Carbon Steel
ASME Section I	PG-23.1 Carbon Steel
ASME Section VIII	UCS-23 Carbon Steel

I. Filler Materials:

1. All covered electrodes, bare wire and rods, flux, and consumable inserts, shall conform to the SFA requirements of ASME Section II, Part C, ASME Section IX Weld Metal Analysis Number A-1.
2. Tungsten electrodes used for the GTAW process shall conform to the requirements of AWS A5.12-69, Class EWTH-1 or EWTH- 2.
3. Backing rings and consumable inserts are not to be used without specific approval by the Engineer of Record.

2. Power piping (high-pressure steam or water per ANSI B31.3) welds shall utilize a TIG root pass with a GTAW cover pass, utilizing a 7018 electrode.

3. All other SMAW shall utilize a 6010 root with 7018 cover passes, except where an E309 rod is required for joining dissimilar metals or stainless steel structures. Flux cored GMAW in the “pulsed spray arc” mode is acceptable for weld-out in lieu of 7018 rod.

4. For TIG welds , filler metal may not be used on tubing or schedule 5 & 10 pipe with all thickness up through 0.083". These welds are to be made in one pass, fusing the ends together. Above 0.083", where two passes are required (see 7 below), filler metal is to be used on the second pass.

5. Diameter of filler metal should be 1/16" to 1/8", depending on pipe size.

J. Preparation of Base Metal:

1. The joint edges shall be prepared by machining, grinding, shearing, oxygen-fuel cutting, or carbon arc air gouging. Regardless of hich method of joint preparation is used, the welding groove shall be smooth, sound metal free of slag, scale and oxides.

2. The joint preparation and adjacent base metal surfaces for one inch adjacent to each edge of the joint preparation shall be free of grease, rust, scale, dirt, paint, lacquer, or other material detrimental to the weld. Cleaning may be accomplished by wire brushing, abrasive blasting, grinding with rubber or resin bonded alumina or silicon carbide grinding wheels, or carbide tools, or by an approved solvent cleaner.

3. For butt weld fittings, the angle of bevel will be acceptable provided it is in accordance with ANSI B16.25, or if it is not less than 30° nor more than 40° measured from a square cut across the pipe.

4. Before starting to weld, the pipe and fittings must be spotlessly and unconditionally clean, inside and out, for at least 1-1/2" on each side of the weld zone (for new pipe and fittings). When used pipe or fitting are being welded, cleaning should be extended to 3" on each side of the weld zone, inside and out. This cleaning shall be accomplished by mechanical means - careful mechanical brushing with a wire brush (of the same material as the pipe) rubbing with emery cloth or silicon carbide grit sandpaper, and final wiping with clean rags. Never use an abrasive containing iron or iron oxide for cleaning purposes. No grease, oil, dust, dirt, paint, sugar or other contaminating materials may be left on the pipe.

K. Fit-up and Tack Welding:

1. Fit-up shall be accomplished using clamps, alignment lugs, tack welds or other appropriate means to properly align the joint for welding. Whenever possible, mechanical means for alignment should be used. If alignment, lugs and/or temporary attachments are used, the material must be of carbon steel.

2. The inside surfaces of piping components to be joined by butt welding shall be aligned so that the misalignment at any point on the inside circumference does not exceed 1/16 inch or 1/4 of the nominal thickness of the component with the thinnest wall, whichever is smaller.

3. If required, to meet fit-up tolerances, material surfaces may be built up by buttering with weld metal in accordance with an approved procedure.

4. Tack and temporary attachment welds shall be made by a qualified welder or shall be removed.

5. Tack welds which are not removed shall be made with an electrode which is the same as the electrode to be used for the first pass.

6. Tack welds must be thoroughly cleaned, ground smooth, carefully examined for cracks, and all cracks removed before additional metal may be deposited.

7. No metal shall be tack-welded inside the pipe for alignment purposes.

8. Tack welds shall be kept to a minimum number and size. When tack welds in open butt single bevel pipe joints are to be incorporated into the production weld, their ends shall be feathered.

9. For TIG butt welds without filler metal, the ends should be butted tight together and tacked using at least 3 or 4 tacks evenly spaced around the joint.

10. For SMAW or TIG with filler metal, one tack should be applied for every 12” of weld, with a minimum of 3 tacks on any weld.

11. Alignment should be rechecked after tacking. All internal and external shielding requirements shall apply to tacking as well as to welding. All tacks shall be carefully cleaned before welding proceeds

L. Shielding

1. All SMAW (stick) welds shall be shielded by standard flux covering on the rod.

2. All TIG welds on carbon steel shall use A75 or CO_2 shield gas.

3. All TIG welds on Stainless steel shall be shielded with welding grade argon, or argon/hydrogen mix.

4. All TIG welds on Hasteloy shall be shielded with welding grade argon 65% / helium 35% mix.

5. Gas shall be introduced at a controlled rate through a flow meter. The suggested normal rate is 15 cu.ft. (420 liters) per hour through a No. 5 cup. A gas lens cup is recommended. The gas is to be stored in the containers in which it is supplied. When a strong draft is blowing in the work area, the welding operation is to be protected so that the shielding gas is effective.

6. In addition to shielding the weld area, the inside of the pipe is to be purged with the shielding gas to prevent oxidation of the inner surface. Initial purging to displace the air in the pipe should be done at a rate of approximately 20 cu.ft. (560 liters) per hour until a volume of argon equal to about 6 times the volume of the piping has been used. The gas is to be introduced through a sealed connection at one end of the pipe and bled off through a small hole at the other end. One way to accomplish this, is by the use of paper masking tape with a small hole punched in the exit and near the top of the pipe. After the initial purge is complete, the gas flow rate should be reduced, during the welding operation, to the level outlined in the welding procedure supplements.

7. Two separate gas cylinders are to be used: One for purging the inside of the pipe and the other for shielding the electrodes.

8. Where more than one pass is required, the pipe shall be internally purged during all passes, not just the first.

M. At least one pass per 1/8" of wall thickness shall be made. Downward welding will not be permitted. The finished weld shall be uniform, with the toe or edge of the weld merging smoothly into the base metal. Butt welds shall have slight reinforcement built up gradually from toe or edge toward the center of the weld. Fillet welds may be slightly concave on the finished surface. No undercutting or overlapping is permitted.

N. All welds shall be full penetration, homogeneous with no voids.

O. In all cases, the welding procedure used shall be one which will produce a weld having an inside surface which is smooth and free from cracks, crevices, or "icicles."

P. All slag or flux remaining on any bead of welding shall be removed before laying down the next successive bead. The finished pass shall be cleaned thoroughly of all flux by first wire brushing, then lightly chipping, and then wire brushing the weld for final cleaning.

Q. Heating of pipe and fittings for straightening will not be permitted without prior approval of the Owner's representative.

R. Minimum preheat and interpass temperature shall comply with the applicable piping design code (i.e., ANSI B31.1 or ANSI B31.3) latest edition.

S. Welding Repairs:

1. Cracks or blow holes or any other weld defects shall be removed by grinding, carbon arc air gouging, or thermal cutting and the prepared cavity shall be so that the angle permits easy electrode manipulation. Care shall be exercised to remove the minimum amount of material necessary to eliminate the defect. Peening to cover defects shall not be allowed.
2. A weld technique sheet per this procedure shall be used in making weld repairs. The contour and dimensions of the repair cavity may differ from the original joint.

T. For carbon steel welding each welder shall identify his production welds by stamping his regularly assigned identification number on the pipe adjacent to the weld on all carbon steel material. Stamps shall be low stress type with a round or "U" shaped cross section.

U. Number of Passes

1. TIG on pipe with wall thickness of up to and including 0.083" is to be welded in one pass, using no filler metal. Above 0.083" through 0.120", a single pass is to be used if the ends are square, and two passes if the ends are beveled. Above 0.120” two or more passes must be made.
2. SMAW shall have a number of passes as outlined in the welding procedure supplements, minimum 2 passes.

V. Cleaning of Welds

1. All tacks and passes are to be cleaned on the outside with a 3M abrasive pad or grinder.
2. If polished or finished welds are required, the finish must be blended to match the finish of the adjacent pipe. No finishing operation may be allowed to cut into the weld in such a way as to weaken it or cause leakage. Wall thicknesses may not be reduced be finishing operations by more than 5% of the nominal wall thickness. Jeweler's rough or other materials containing iron or iron oxide may not be used in the polishing operation. 3M - green abrasive pads on a die grinder are preferred for polishing.

W. Appearance of Finished Welds

1. GTAW welds should have a uniform cover pass with a “row of dimes” finished appearance.There shall be a moderately raised appearance with no apparent voids, porosity or undercuts All spatters or slag shall be removed.

2. All tacks and passes are to be cleaned on the outside with a 3M abrasive pad or grinder.

3. TIG welds shall be smooth and even, with as little build-up or undercut as possible. There should be no undercut or inside sag or more than 1/64". The weld must be free of pits, crevices and cracks. There must be full penetration.

3.6 FABRICATION - FLANGED JOINTS

A. Flange dimensions and drilling are to conform to ANSI Standards for the pressure classes involved.

B. All bolt holes shall straddle normal horizontal and vertical centerlines of flanges unless noted otherwise on the drawings. All bolt holes are to be spot faced.

C. Steel flanges which are to be bolted to flat faced flanges on valves or equipment shall be flat faced and furnished with full face gaskets.

D. All flange facings shall be protected from damage. Any flange facings marred or otherwise damaged shall be refaced.

E. All flange facings shall be in alignment before bolting is begun. All bolts in flanged joints shall be coated with antiseize thread compound and uniformly tightened. Care shall be taken to obtain uniform pressure on all gaskets and avoid overstressing of bolts or dishing of flanges.

F. Flanges in piping runs shall not be out of square more than 3/64 inch per foot of outside diameter of flange. Angular tolerances shall be plus or minus 1/2 degree.

G. The materials of bolts and nuts shall be as specified in the Piping Material Specification for each particular system.

H. On distilled water, deionized water or other services where sanitation is extremely important, the inside diameter of gaskets must match the inside diameter of flanges, to minimize pockets.

3.7 FABRICATION - SCREWED JOINTS

A. All pipe threads shall be concentric with the outside of the pipe and conform to ANSI B2.1. The ends shall be reamed after cutting to remove all fines and burrs.

B. Threading on hydraulic piping shall be in accordance with JIC Standards.

C. For pipe materials (such as carbon steel to carbon steel, brass to brass, etc.) teflon tape, as specified in the piping material specification, shall be used on make end only, except when seal welding or brazing, etc., is specified.

D. Seal welding of screwed joints shall not be used unless so specified on the drawings. Where welding is specified, pipe tape shall not be used in the joint and the weld should cover all exposed threads.

E. On all screwed connections, and particularly at screwed valves, care shall be exercised to guard against overly long threading which would allow the pipe to be screwed into the valve so deeply that seating surfaces could be distorted.

F. Screwed connections at instrument shall not be seal welded.

G. Orifice flange taps shall be seal welded in all socket weld piping classes.

3.8 END PREPARATION

A. Where cuts are necessary, pipe end shall be square cut using an abrasive wheel, or a metal saw with a Tri-clover saw guide. The blades and/or wheels used must be new at the start of the job and be used for cutting similar material only.

B. Burrs on the inside and outside of pipe shall be removed with a grinder. The direction of grinding is to be around the pipe wall, not in and out. The result is to be a chamfered edge and square cut land for schedule 40 welds utilizing filler metal (see weld data sheet) or a square butt edge without chamfer for TIG butt welding of schedule 5, 10 or tubing.

C. Before starting to weld, the pipe and fittings must be spotlessly and unconditionally clean, inside and out, for at least 1-1/2” on each side of the weld zone (for new pipe and fittings). When used pipe or fitting are being welded, cleaning should be extended to 3” on each side of the weld zone, inside and out. This cleaning shall be accomplished by mechanical means- careful mechanical brushing with a wire brush (of the same material as the pipe) rubbing with emery cloth or silicon carbide grit sandpaper, and final wiping with clean rags. Never use an abrasive containing iron or iron oxide for cleaning purposes. No grease, oil, dust dirt, paint, sugar or other contaminating materials may be left on the pipe.

D. Ends of valves or other accessories are to be machined to match pipe wall thicknesses.

3.09 PIPE & VALVE IDENTIFICATION

A. Upon completion of work, attach engraved laminated tags to all valves. Valve tags shall have black characters on white face, consecutively numbered and prefixed by letter “V”. Equipment tags shall have black characters on white face, with labels corresponding to drawing schedule numbers.

B. Embossed or engraved aluminum or brass tags may be substituted if desired. Tags shall be at least 1/8” thick.

C. Valve tags shall be at least 1” in diameter with numerals at least 3/8” high and attached by “S” hooks or chains. Equipment tags shall be at least 2” diameter securely attached to apparatus.

D. Pipe Identification:

1. Provide color-coded pipe identification markers on piping installed under this Section. Pipe markers shall be snap on laminated plastic protected by clear acrylic coating.

2. Provide arrow with each pipe content marker to indicate direction of flow. If flow can be in either direction then use a double headed arrow marker.

3. Mains shall be labeled at points of entrance and exit from mechanical room, outside chiller areas, adjacent to each valve, on each riser, at each tee fitting, at least once in each room, and at intervals no longer than 20 ft. Where pipe penetrates a wall, markers shall be placed near each side of the wall.

4. Size of legend letters on markers and length of color field shall be per the latest edition of ANSI.

5. Markers shall be “Setmark” by Seton Name Plate Corp. or approved equal.

6. The following piping systems shall be identified both inside and outside of the building with flow arrows:

Drawing Abbreviation	Pipe Identification Symbol
CHWS	Chilled Water Supply
CHWR	Chilled Water Return

3.10 PIPE CLEANING

A. All new and existing piping shall be cleaned and flushed prior to system connection by the following methods.

1. Representative from an approved chemical company hired by the piping contractor shall supply chemicals and witness all pipe cleaning.

2. When water/chemical mixture is attained it shall be circulated for four (4) hours, minimum.

3. After Cleaning, lines shall be flushed with water until clear.

4. Pipe cleaning shall be documented by this contractor and witnessed by the engineer.

5. Remove and clean strainers in air separators and pump suction diffusers after 24 hours of operation and after 14 days of operation.

6. Refer to 61562 – 15189 “HVAC Water Treatment” for additional instructions and scope of work.

3.11 PRESSURE TESTING OF WATER SYSTEMS

A. All new piping systems shall be tested at a pressure of 150 psig for a period of 24 hours.

B. Preparation for testing:

1. All joints shall be visually examined for proper installation.

2. All piping shall be left un-insulated.

C. Testing Procedure

1. Water Piping shall by hydro tested for pressure and duration as specified.

2. Precautions shall be taken to keep non-essential personnel clear of the piping system undergoing test.

4. Where leaks occur they shall be marked and identified for repair after termination of test. Where major leaks or additions are made to the piping system after the pressure test, affected piping shall be retested.

5. Provide testing records for each pressure test. Records shall include:

a. Date of Test
b. Identification of piping tested
c. Test medium
d. Test pressure and total time held at test pressure.
e. Signature of witness (Owner or Engineer).

6. Schedule of Test Requirements

5. New Chilled & Condenser Water Piping: Hydrostatic, 150 psig at high point of system for (24) hours duration.

3.12 DOCUMENTATION REQUIREMENTS

A. This contractor shall provide the as-built/certified documents in an indexed contractor turnover package with signatures from the Contractor's representative certifying the accuracy of the information and compliance with this specification.

+ + END OF SECTION 235000 + +

TABLE OF CONTENTS

AIR-COOLED CHILLER
SECTION 15685

1.0 GENERAL

1.1 SCOPE OF WORK

A. Provide, deliver and install two (2) water cooled centrifugal chillers including any accessories specified herein.

B. Submittals and documentation requirements as specified herein.

C. Start-up services including cost for hiring factory representative to perform a installation check and start-up assistance.

D. Field assembly of the chillers will be required for installation. As a minimum the VFD's, compressors, Optiview controls will need to be shipped loose as needed to install units in their final location as indicated on the plans.

E. Chiller costs shall include factory testing, factory dismantling and factory support and testing for reassembling of the chiller in the field.

F. The chiller shall be tested for refrigerant leaks both at the factory and field.

G. The initial charge of refrigerant shall be supplied, shipped in containers and cylinders for field installation or factory charged in the chiller.

H. Chillers to be provided with all controls as required for a variable primary flow application.

1.2 SUBMITTALS

A. General: Submit each item in this Article according to the conditions of the Contract. Obtain approval from Engineer/Owner before proceeding with fabrication and work. Six (6) copies shall be submitted to the Construction Manager.

B. Product data for each chiller specified, including the following:

1. General assembly, components, safety controls, wiring diagrams, service connections and service clearances.

2. Certified chiller performance curves with system operating conditions indicated. Provide computerized selection indicating the following listed below and criteria listed on the contract schedule sheet:

a. Chiller refrigerant.
b. Chiller capacity.
c. Condenser pressure drop.
d. Cooler pressure drop.
e. Part load performance.
f. Energy usage.

3. Dimensional data, unit weight, support and clearance requirements.

4. Electrical data.

5. Material gages and finishes.

6. All accessories being provided.

7. Predicted noise data for unit at full load, measured at a distance of 5 ft. from the compressor end of package in accordance with ARI-575.

C. Shop Drawings from manufacturer detailing equipment assemblies and indicating dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection.

D. Wiring diagrams detailing wiring for power and control systems and differentiating between manufacturer-installed and field-installed wiring.

E. Operation and Maintenance manuals.

F. Installation and start-up instructions.

G. Certificate of performance from the factory.

1.3 QUALITY ASSURANCE

A. Acceptable manufacturers include those companies specializing in the manufacture of the types of units specified herein, provided that they meet the construction and performance requirements of this Specification.

B. Chiller shall be rated in accordance with the latest edition of ARI Standard 550/590. Only chillers that are listed in the ARI Certification Program for Centrifugal and Rotary Screw Water Chillers are acceptable.

B. Unit shall be designed to conform to ANSI B9.1 Safety Code, ASME/ANSI B31.5 Refrigeration Piping Code, and ASHRAE Std. 15, Safety Code for Mechanical Refrigeration where applicable. Vessels shall be designed and stamped in accordance with ASME Section VIII, Code for Unfired Pressure Vessels. Control panels shall be UL Listed, and designed in accordance with the National Electrical Code.

C. Chiller shall be factory tested at full and part load conditions, and a full test report shall be provided to the Owner

D. ASME Compliance: Comply with ASME “Boiler and Pressure Vessel Code,” Section VIII, “Pressure Vessels,” Division 1, “Basic Coverage” for construction and testing cooler and condenser pressure vessels. Stamp cooler and condenser with ASME mark.

E. NEC Compliance: Comply with applicable NEC requirements pertaining to electrical power and control wiring.

1.4 SAFETY AND HEALTH

A. All equipment shall comply with the latest edition of EPA, OSHA, NFPA, UL, ANSI, ASHRAE, ASTM, NFPA standards, and other National, state, and local codes and regulations applicable at the Owner's plant location in Providence, R.I.

1.5 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: Protect chillers from damage by factory packing.

B. Acceptance on Site: Reject any damaged chiller upon arrival.

C. Storage and Protection: Store chillers to prevent damage, and protect from weather, dirt, fumes, water and construction debris. Provide a clean dry space if available.

D. Handling: Handle chillers according to the manufacturer’s rigging and installation instructions for unloading and transporting into the final location.

1.6 MECHANICAL GUARANTEE

A. The manufacturer shall guarantee that the equipment supplied meets the specifications, and that it will achieve the performance requirements. The guarantee shall cover parts and labor including motors, controls, and other items specified by the chiller supplier, whether or not manufactured by him. Equipment which fails to meet the performance guarantee, and equipment, materials, parts, and appurtenances which become defective under normal and proper use and maintenance before the end of the guarantee period shall be replaced or repaired to the Owner's satisfaction. Repair or replacement shall be initiated promptly upon receipt by the Vendor of notice from the Owner of the defect, and shall be completed as expeditiously as possible. Work under the guarantee shall be performed by qualified service personnel.

B. The guarantee shall be in effect for a one-year period, beginning on the date of the chiller start-up and Owner acceptance. Formal acceptance is required.

C. Provide an additional five year parts and labor warranty on compressors.

1.6 PERFORMANCE GUARANTEE

A. The Manufacturer shall guarantee to the Owner, that the packaged water chiller units, including all mechanical equipment, compressor, control devices, piping, wiring, and the structural integrity of the frame, are free from defects in materials and workmanship, for the warranty period specified. The Manufacturer shall repair or replace any items found to be defective within the warranty period at no cost to the Owner.

B. The Manufacturer shall guarantee the performance of the packaged water chiller units to meet or exceed the certified performance data provided with the submittal, including:

1. The chiller unit must produce the full cooling temperature differential specified at the design water flow rate, at or below the design tower water temperature using equal or less total power than specified.

2. The discharge water temperature listed in the design data table must be maintained at set point, ± ½ F at actual loads from 20% to 100% of rated full load capacity.

1.7 SELECTION CRITERIA

A. Refer to plans for performance data

B. Refer to plans for space considerations

2.0 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. SMARDT

B. York (Design Basis)

C. Daikin

2.2 COMPRESSORS

A. The compressor shall be a single-stage centrifugal type powered by a high speed electric motor. A cast aluminum, fully shrouded impeller shall be mounted directly to the motor shaft. The impeller shall be designed for balanced thrust, dynamically balanced and overspeed tested for smooth, vibration-free operation. Compressor castings shall be designed for 235 psig working pressure and hydrostatically pressure tested at 355 psig for HFC R-134a units.

B. Capacity control shall be achieved by the combined use of variable speed and variable diffuser geometry to provide fully modulating control from maximum to minimum load while maintaining constant chiller leaving water temperature.

2.3 MOTORS

A. The compressor motor shall be a hermetic, oil free, permanent magnet type directly coupled to the compressor. The motor will be bolted to a cast iron adapter plate mounted on the compressor to provide factory alignment of the shaft. The motor shaft shall be supported on active magnetic radial and thrust bearings. Magnetic bearing control shall be equipped with auto vibration reduction and balancing systems. During a power failure event, the magnetic bearings shall remain active throughout the compressor coast down. Rolling element bearings shall be provided as a backup to the magnetic bearings designed for emergency touch down situations. Motor stator and rotor shall be equipped with a pressure driven refrigerant cooling loop to maintain acceptable operating temperatures.

2.4 VARIABLE SPEED DRIVE

A. A variable speed drive shall be factory installed on the chiller. It will vary the compressor motor speed by controlling the frequency and voltage of the electrical power to the motor. The capacity control logic shall automatically adjust motor speed and compressor diffuser geometry for maximum part-load efficiency by analyzing information fed to it by sensors located throughout the chiller.

B. Drive shall be PWM type utilizing IGBT's with a power factor of 0.97 or better at all loads and speeds.

C. The variable speed drive shall be unit mounted in a NEMA 1 enclosure with all power and control wiring between the drive and chiller factory installed. Field power wiring shall be a single point connection and electrical lugs for incoming power wiring will be provided. The entire chiller package shall be UL listed.

D. The following features will be provided:

1. Door interlocked circuit breaker capable of being padlocked.
2. Ground fault protection.
3. Over voltage and under voltage protection.
4. 3-phase sensing motor over current protection.
5. 3-phase sensing input over current protection.
6. Single phase protection.
7. Insensitive to phase rotation.
8. Over temperature protection.
9. IEEE Std. 519-1992 compliance
10. Digital readout at the chiller unit control panel of output frequency, output voltage, 3-phase output current, input Kilowatts and Kilowatt-hours, self-diagnostic service parameters. Separate meters for this information will not be acceptable.
11. KW Meter - The unit's input power consumption will be measured and displayed digitally via the unit's control panel. The KW meter accuracy is typically +/- 3% of reading. KW meter scale is 0 - 788 KW
12. KWh Meter – The unit's cumulative input power consumption is measured and displayed digitally via the unit's control panel. The KWh meter is resetable and it's accuracy is typically +/- 3% of reading. KWh meter scale is 0 – 999,999 kWh.
13. Ammeter – Simultaneous three-phase true RMS digital readout via the unit control panel. Three current transformers provide isolated sensing. The ammeter accuracy is typically +/- 3% of reading. Ammeter scale is 0 - 545 A RMS .
14. Voltmeter – Simultaneous three-phase true RMS digital readout via the unit control panel. The voltmeter accuracy is typically +/- 3% of reading. Voltmeter scale is 0 – 670 VAC.
15. Elapsed Time Meter – Digital readout of the unit's elapsed running time (0 – 876,600 hours, resetable) is displayed via the unit control panel.

2.5 EVAPORATOR

A. Evaporator shall be a shell-and-tube, hybrid falling film type designed for 235 psig working pressure on the refrigerant side. Shell shall be fabricated from rolled carbon steel plate with fusion welded seams; have carbon steel tube sheets, drilled and reamed to accommodate the tubes; and intermediate tube supports spaced no more than four feet apart. The refrigerant side shall be designed, tested and stamped in accordance with ASME Boiler and Pressure Vessel Code, Section VIII- Division 1. Tubes shall be high-efficiency, internally and externally enhanced type having plain copper lands at all intermediate tube supports to provide maximum tube wall thickness at the support area. Each tube shall be roller expanded into the tube sheets providing a leak-proof seal, and be individually replaceable. Water velocity through the tubes shall not exceed 12 fps. A liquid level sight glass will be located on the side of the shell to aid in determining proper refrigerant charge. A suction baffle eliminator will be located above the tube bundle to prevent liquid refrigerant carryover to the compressor. The evaporator shall have a refrigerant relief device sized to meet the requirements of ASHRAE 15 Safety Code for Mechanical Refrigeration.

B. Water boxes shall be removable to permit tube cleaning and replacement. Stubout water connections having victaulic grooves will be provided. Waterboxes shall be designed for 150psi (10.3 bar) design working pressure and tested at 225 psig (15.5 bar). Vent and drain connections with plugs will be provided on each water box. Low flow protection shall be provided by a thermal-type flow sensor, factory mounted in the water nozzle connection and wired to the chiller control center.

2.6 CONDENSER

A. Condenser shall be of the shell-and-tube type, designed for 235 psig working pressure on the refrigerant side. Shell shall be fabricated from rolled carbon steel plate with fusion welded seams; have carbon steel tube sheets, drilled and reamed to accommodate the tubes; and intermediate tube supports spaced no more than four feet apart. The refrigerant side shall be designed, tested and stamped in accordance with ASME Boiler and Pressure Vessel Code, Section VIII- Division 1. Tubes shall be high-efficiency, internally and externally enhanced type having plain copper lands at all intermediate tube supports to provide maximum tube wall thickness at the support area. Each tube shall be roller expanded into the tube sheets providing a leak-proof seal, and be individually replaceable. Water velocity through the tubes shall not exceed 12 fps.

B. Water boxes shall be removable to permit tube cleaning and replacement. Stubout water connections having ANSI/AWWA C-606 grooves will be provided. Waterboxes shall be designed for 150 psi (10.3 bar) design working pressure and tested at 225 psig (15.5 bar). Vent and drain connections with plugs will be provided on each water box.

2.7 REFRIGERANT FLOW CONTROL

A. Refrigerant flow to the evaporator shall be controlled by a variable orifice for improving unloading capabilities. The variable orifice control shall automatically adjust to maintain proper refrigerant level in the condenser and evaporator. This shall be controlled by monitoring refrigerant liquid level in the condenser, assuring optimal subcooler performance.

2.8 GRAPHICS CONTROL CENTER

A. **General:** The chiller shall be controlled by a stand-alone microprocessor based control center. The chiller control center shall provide control of chiller operation and monitoring of chiller sensors, actuators, relays and switches.

B. **Control panel:** The control panel shall include a 10.4 in. diagonal color liquid crystal display (LCD) surrounded by “soft“ keys which are redefined based on the screen displayed at that time. This shall be mounted in the middle of a keypad interface and installed in a locked enclosure. The screen shall detail all operations and parameters, using a graphical representation of the chiller and its major components. Panel verbiage shall be available in English as standard and in other languages as an option with English always available. Data shall be displayed in either English or Metric units. Smart Freeze Point Protection shall run the chiller at 36.00°F leaving chilled water temperature, and not have nuisance trips on low water temperature. The sophisticated program and sensor shall monitor the chiller water temperature to prevent freeze up. When needed Hot Gas Bypass is available as an option. The panel shall display countdown timer messages so the operator knows when functions are starting and stopping. Every programmable point shall have a pop-up screen with the allowable ranges, so that the chiller can not be programmed to operate outside of its design limits.

1. The chiller control panel shall also provide:
    1. System operating information including:
        a. return and leaving chilled liquid temperature
        b. return and leaving condenser liquid temperature
        c. evaporator and condenser saturation temperature
        d. evaporator and condenser pressure
        e. compressor discharge temperature
        f. percent full load motor current
        g. motor frequency
        h. magnetic bearing levitation status
        i. magnetic bearing temperatures
        j. operating hours
        k. number of compressor starts

2. Digital programming of setpoints through the universal keypad including:
    a. leaving chilled liquid temperature
    b. percent current limit
    c. pull-down demand limiting
    d. six-week schedule for starting and stopping the chiller, pumps and tower
    e. remote reset temperature range

3. Status messages indicating:
    a. system ready to start
    b. system running
    c. system coastdown
    d. system safety shutdown-manual restart
    e. system cycling shutdown-auto restart
    f. MBC startup
    g. start inhibit

4. The text displayed within the system status and system details field shall be displayed as a color coded message to indicate severity: red for safety fault, orange for cycling faults, yellow for warnings, and green for normal messages.

5.Safety shutdowns enunciated through the display and the status bar, and consist of system status, system details, day, time, cause of shutdown, and type of restart required. Safety shutdowns shall include:

a.evaporator – low pressure
b. evaporator – transducer or leaving liquid probe
c. evaporator – transducer or temperature sensor
d. condenser – high pressure contacts open
e. condenser – high pressure
f. condenser – pressure transducer out of range
g. auxiliary safety – contacts closed
h. discharge – high temperature
i. discharge – low temperature
j. control panel – power failure
k. watchdog – software reboot
l. MBC – Internal Fault
m. MBC – High Bearing Temperature
n. MBC – Cable Fault
o. MBC – Speed Signal Fault
p. MBC – Overspeed Fault
q. MBC – Communication
r. MBC – High Bearing Current
s. MBC – Rotor Elongation
t. MBC – Oscillator Fault
u. MBC – Power Supply Fault
v. MBC – Unauthorized Rotation
w. MBC – No Rotation
x. VSD Shutdown – Requesting Fault Data
y. VSD – Stop contacts Open
z. VSD – DC Bus Preregulation Lockout
aa. VSD – Logic Board Plug
bb. VSD – Ground Fault
cc. VSD – Phase __ Input DCCT (A,B,C)
dd. VSD – Phase __ Motor DCCT (A,B,C)
ee. VSD – Input Current Overload
ff. VSD – 105% Motor Current Overload
gg. VSD – High Phase __ Input Baseplate Temperature (A,B,C)
hh. VSD – High Phase __ Motor Baseplate Temperature (A,B,C)
ii. VSD – Motor or Stator Current Imbalance
jj. VSD – Motor Current THD Fault
kk. VSD – Motor Synchronization Fault
ll. VSD – Rectifier Program Fault
mm. VSD – Inverter Program Fault

6.Cycling shutdowns enunciated through the display and the status bar, and consists of system status, system details, day, time, cause of shutdown, and type of restart required. Cycling shutdowns shall include:

a. multiunit cycling – contacts open
b. system cycling - contacts open
c. control panel - power failure
d. leaving chilled liquid - low temperature
e. leaving chilled liquid - flow switch open
f. condenser – flow switch open

g. motor controller – contacts open
h. motor controller – loss of current
i. MBC – Position
j. MBC – Low Frequency Displacement
k. MBC – Vibration
l. MBC – High Amplifier Temperature
m. MBC – High DC/DC Temperature
n. MBC – No Levitation
o. MBC – Serial Communications Fault
p. Power Fault
q. Control Panel – Schedule
r. VSD Precharge – Low DC Bus Voltage
s. VSD – DC Bus Preregulation
t. VSD – Logic Board Power Supply
u. VSD – High DC Bus Voltage
v. VSD – High Phase __ Input Current (A,B,C)
w. VSD – High Phase __ Motor Current (A,B,C)
x. VSD – Phase __ Input Gate Driver (A,B,C)
y. VSD – Phase __ Motor Gate Driver (A,B,C
z. VSD – Single Phase Input Power
aa. VSD – DC Bus Under Voltage
bb. VSD – Low Phase __ Input Baseplate Temperature (A,B,C)
cc. VSD – Low Phase __ Motor Baseplate Temperature (A,B,C)
dd. VSD – High Internal Ambient Temperature
ee. VSD – Serial Communications
ff. VSD – Logic Board Processor
gg. VSD – Run Signal
hh. VSD Shutdown – Requesting Fault Data
ii. VSD – Stop Contacts Open
jj. VSD – Initialization Failed

7. Security access to prevent unauthorized change of setpoints, to allow local or remote control of the chiller, and to allow manual operation of the prerotation vanes. Access shall be through ID and password recognition, which is defined by three different levels of user competence: view, operator, and service.

8. Trending data with the ability to customize points of once every second to once every hour. The panel shall trend up to 6 different parameters from a list of over 140, without the need of an external monitoring system.

9. The operating program stored in non-volatile memory (EPROM) to eliminate reprogramming the chiller due to AC power failure or battery discharge. Programmed setpoints shall be retained in lithium battery-backed RTC memory for a minimum of 11 years with power removed from the system.

10. A fused connection through a transformer in the compressor motor starter to provide individual over-current protected power for all controls.

11. A numbered terminal strip for all required field interlock wiring.

12. An RS-232 port to output all system operating data, shutdown / cycling message, and a record of the last 10 cycling or safety shutdowns to a field-supplied printer. Data logs to a printer at a set programmable interval. This data can be preprogrammed to print from

1minute to 1day.

13. The capability to interface with a building automation system to provide:
    a. remote chiller start and stop
    b. remote leaving chiller liquid temperature adjust
    c. remote current limit setpoint adjust
    d. remote ready to start contacts
    e. safety shutdown contacts
    f. cycling shutdown contacts
    g. run contacts

2.9 CHILLER OPTIONS

A. Provide for each circuit refrigerant suction, discharge, and oil pressure gauges with isolation valves.

B. Provide suction service valve option to isolate refrigerant charge (in evaporator or condenser) during servicing.

C. Provide (4) vibration spring isolators shipped with chiller.

D. Provide additional dry contacts for the Building Management System control. Building Management System shall be capable of the following:

1. Start/Stop
2. Status
3. CHWS Setpoint
4. General Alarm

E. Factory Insulation

1. Factory-applied, anti-sweat insulation shall be attached to the cooler shell, flow chamber, tube sheets, suction connection, and (as necessary) to the auxiliary tubing. The insulation shall be a flexible, closed-cell plastic type, 3/4 thick, applied with vapor-proof cement. The insulation will normally prevent sweating in environments with relative humidity up to 75% and dry bult temperatures ranging from 50 to 90 °F.

2.10 ELECTRICAL REQUIREMENTS

A. The packaged chiller unit shall operate on 460v/3ph/60Hz power, with 115v/1ph/60Hz controls, using its own control power transformer.

B. All unit power wiring shall enter the casing at a single location.

C. All power wiring shall be in conduit - no exposed wiring shall be permitted. All power or control wiring within the condenser section and any other wiring exposed to the elements shall be in vapor tight conduit.

D. All electronic enclosures supplied by the Vendor shall be NEMA 1.

E. Provide a non-fused power disconnect switch.

2.11 MARKING

A. Each piece of equipment shall be provided with a stainless steel nameplate, permanently attached to the exterior of the equipment, in an accessible location external to any insulated surface, and observable while the equipment is in operation. The nameplate shall include the following information:

1. Manufacturer's name, model, and serial number.
2. Year built.
3. Nominal capacity.
4. Purchaser's equipment identification number (CH-1 or CH-2).
5. Weight of equipment.
6. Design (pressure/temperature).

3.0 EXECUTION

3.1 EXAMINATION & STORAGE

A. Examine areas to receive chillers for compliance with requirements for installations tolerances and other conditions affecting chiller performance. Examine proposed route of moving chillers into place and verify that it is free of interferences. Verify piping rough-in locations. Verify branch circuit wiring suitability. Do no proceed with installation until unsatisfactory conditions have been corrected.

B. Final locations of the chillers on the Drawings are approximate, unless dimensioned. Determine exact locations before roughing-in piping and electrical work.

C. This Sub-Contractor shall be responsible for storing the chiller on or off site as directed by the Construction Manager.

3.2 INSTALLATION

A. Install chillers according to manufacturer’s written instructions.

B. Install and anchor chiller plumb and level.

C. Install vibration isolators according to isolator manufacturer’s recommendations.

D. Maintain manufacturer’s recommended clearances for service and maintenance.

E. Install piping connections, maintaining clearances for service and maintenance.

F. Install flanged connections at chillers.

G. Field-insulate cooler, suction lines, and other surfaces where condensation might occur.

H. Electrical Wiring: Install electrical devices furnished loose by manufacturer, including remote pressure switches and remote chiller control panel. Furnish copy of manufacturer’s wiring diagram submittal to Electrical Installer.

I. Provide equipment required for installation of chillers.

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Provide services of a factory-authorized service representative to supervise the field assembly of components and installation of chillers, including piping and electrical connections, and to report results in writing.

3.4 CLEANING

A. Cleaning units using materials and methods recommended by manufacturer.

B. Clean finishes to remove dust and dirt.

C. Touch up scratches on unfinished surfaces to restore corrosion resistance.

D. Touch up scratches on finished surfaces to restore finish.

E. Disposal of any debris associated with the installation of the chillers.

3.5 START-UP SERVICES

A. Start-Up Services: Provide factory-authorized service representatives to start chillers and to demonstrate and train owner's maintenance personnel as specified below:

1. Test and adjust chiller controls and safeties. Lubricate rotating parts. Verify that motor amperage conforms to manufacturer's data.

2. Start chillers and verify performance. Demonstrate operation to Owner.

3. Train Owner's maintenance personnel on procedures and schedules for start, shutdown, troubleshooting, servicing, and preventative maintenance.

4. Review data in operating and maintenance manuals. Refer to Division 1 Section "Operating and Maintenance Data."

5. Schedule training with the Owner through the Construction Manager with at least 7 days' notice.

6. Operator training (minimum 16 hours), including but not limited to:

   a. Procedures and schedules for startup and shutdown.
   b. Troubleshooting.
   c. Servicing and preventive maintenance.
   d. Review data in operating and maintenance manuals.

7. The service representative shall submit three (3) copies of the start up report to the Owner within two weeks of start up. Training shall be scheduled with the Owner through the engineer with at least 7 days notice.

8. The chiller manufacturer shall provide a checklist for completion by the Construction Manager and approval by the Owner after installation of the units, to ensure that they are ready for start-up. The manufacturers shall schedule the start-up service within two weeks of request given by the Owner.

9. Vendor to provide an estimate of the startup duration

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3.6 COMMISSIONING

A. Operate equipment controls and safeties.

B. Lubricate rotating parts.

C. Verify that motor amperage complies with manufacturer’s data.

+ + END OF SECTION 236800 + +

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1.0 GENERAL

1.1 PERFORMANCE REQUIREMENTS

A. All work specified herein shall be accomplished in accordance with the applicable requirements of Section 55587 - 230000 - General Requirements for Heating, Ventilating and Air Conditioning.

B. Pumps, other than the scheduled model, may also be rejected, which operate in an inappropriate portion of their performance curves, including but not limited to, operating in the rightmost third of the curve. Provide in submittals, the factory performance curve specific for this contract.

C. Pumps shall be designed specifically for intended classes of service, with non-overloading characteristics throughout the design curve (motors shall not operate in their service factor). Impeller shall be statically and dynamically balanced. Impeller size shall be no more than 90% of casing size. Pump shall be factory tested at operating conditions, thoroughly cleaned, and painted with one coat of machinery enamel prior to shipment. Installation instructions shall be included with pump at time of shipment.

D. Coordinate with manufacturer of water treatment to ensure that normal life of pumps and components shall not be foreshortened by water treatment.

E. Provide, under the work of the mechanical section, flexible connections (if shown on details) and vibration isolation components for all pumps.

F. Motors shall be totally enclosed, fan-cooled, premium efficiency type in accordance with the applicable requirements of Section 15000 - General Requirements for Heating, Ventilating and Air Conditioning.

G. Provide an allowance for all necessary work in the field and shop to trim each pump impeller, if needed, for water balancing purposes.

1.2 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 15 Specification Section 15000 “Mechanical Requirements”.

B. Product data including certified performance curves and rated capacities of selected models, weights (shipping, installed, and operating), furnished specialties, and accessories. Indicate pump’s operating point on curves.

C. Shop drawings showing pump layout and connections. Include setting drawings with templates, directions for installation of foundation and anchor bolts, and other anchorages.

D. Wiring diagrams detailing wiring for power, signal, and control systems and differentiating between manufacturer-installed wiring and field-installed wiring.

E. Product certificates signed by manufacturers of pumps, certifying accuracies under specified operating conditions and compliance with specified requirements.

F. Maintenance data for pumps to include in the operating and maintenance manual specified in specification Section 15000. Include startup instructions.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with provisions of the following:

1. ASME B31.9 “Building Services Piping” for piping materials and installation.

2. Hydraulic Institute’s “Standards for Centrifugal, Rotary & Reciprocating Pumps” for pump design, manufacture, testing, and installation.

3. UL 778 “Standard for Motor Operated Water Pumps” for construction requirements. Include UL listing and labeling.

4. NEMA MG 1 “Standard for Motors and Generators” for electric motors. Include NEMA listing and labeling.

5. NFPA 70 “National Electrical Code” for electrical components and installation.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store pumps in dry location.

B. Retain shipping flange protective covers and protective coatings during storage.

C. Protect bearings and couplings against damage from sand, grit, and other foreign matter.

D. Extended Storage Longer than 5 Days: Dry internal parts with hot air or vacuum-producing device. Coat internal parts with light oil, kerosene, or antifreeze after drying. Dismantle bearings and couplings; dry; coat with acid-free, heavy oil; tag; and store in dry location.

E. Comply with pump manufacturer’s rigging instructions.

2.0 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. TACO Pumps, Inc.

B. Bell & Gossett Pumps, Inc.

C. Armstrong Pumps, Inc.

2.2 GENERAL

A. Pump Types and Materials of Construction

1. For types of pumps listed below, bearing frame and pump internals shall be serviceable without disturbing motor or connected piping.

2. For all types of pumps listed below, provide mechanical seals with carbon rings and ceramic faces, stainless or brass metal parts, stainless springs and synthetic rubber bellows. Seals shall operate satisfactorily to 250°F.

3. Unless otherwise stated in the schedules, all pumps shall be single stage.

4. Provide tappings for pressure gauges at inlet and discharge and tapping for drain port at the bottom of the casing.

2.3 CONDENSER WATER PUMPS

A. Furnish and install as shown on the plans. Vertical flexible coupled type split-case, double suction, single stage centrifugal pump of bronze fitted all iron construction. The pump shall be capable of delivering design conditions as indicated on the contract drawings.

B. Pumps shall operate at a maximum synchronous speed of 1750 rpm. A unit operating at a lesser rotative speed will be considered, but in no event will a pump operating at more than the maximum speed specified be acceptable.

C. The pump casing halves shall be of the inline piping design and will be constructed of APCO-LOY 33, C.I. having a minimum tensile strength of 30,000 psi and shall be of sufficient thickness to withstand stresses and strains at full operating pressures. Casings shall be subject to a hydrostatic pressure test of 150% of the specified duty point. Bearing housing supports, suction and discharge flanges shall be integrally cast with the lower half of the casing. Removal of the upper half of the casing must allow the rotating element to be removed without disconnecting the suction and discharge flanges. The upper casing is to be dowel aligned to the lower casing. Pump sizes 10" and larger are to be of the twin volute design. Drain openings must be provided in the bearing arms for removal of lubricating liquid.

D. Impeller shall be of the enclosed double suction type and shall be of vacuum cast bronze. Impeller shall be dynamically balanced and securely fastened to the shaft by key and screw locked shaft sleeves. The vanes shall be designed to reduce noise. The pump shaft shall be made of high grade SAE 1045 steel or equal, accurately machined to give a true running rotating element. The shaft shall be protected from wear by bronze sleeves which are key locked and threaded so that the sleeves tighten with the rotation of the shaft. Buna O-rings must be provided between the impeller hub and the shaft sleeves to prevent pumped liquid from corroding the shaft. Pump shall be equipped with easily renewable bronze casing rings so designed that hydraulic pressure will seat them against a shoulder in the pump case around the full periphery of the wearing ring. The wear rings will be locked in place by doweling to prevent rotation. The rotating element shall be mounted in heavy duty grease lubricated ball bearings and shall be equipped with water slingers on side next to pump glands.

E. Bearing housing shall be so designed to flush lubricant through and provide continuous cleaning of bearing surfaces and maximum protection against overheating. The bearing housings are to be of C.I. and shall be furnished with a set of regreaseable bearings for both radial and thrust loads. The bearings shall have an average life of 250,000 hours and shall be mounted in machined, moisture and dust proof housings. The housings are to be bolted to the pump casing to ensure permanent alignment.

F. Mechanical seal boxes shall be placed on both sides of the pump centerline to seal the pump shaft. Each pump is to be furnished with mechanical seals with all metal parts to be 303 stainless steel with Buna-N elastomers, Ni-Resist seat, and carbon washer. A bypass line must be provided for the upper seal between the seal faces and the discharge flange to assure adequate venting of the seal chamber and to provide lubrication. All pumps shall be provided with cored passages in the parting flange of the pump to provide additional circulation to both seals. The mechanical seal boxes shall be

equipped with heavy, cast, one piece O-ring sealed glands. The pump shall be supported by a cast iron drip rim base.

G. Vertical flexible coupled pumps shall be furnished with a cast iron motor bracket which is to be bolted to the vertical casing. The motor bracket must be machined with a register fit to ensure proper alignment of motor and pump shaft.

H. The pumps shall be flexible coupled to a standard vertical NEMA totally enclosed fan cooled motor with efficiencies as indicated in Section 2.4.

2.4 CHILLED WATER PUMPS

A. Pumps

1. Pumps shall be based-mounted, single-stage, end suction design with an integrally cast, foot mounted volute, capable of the impeller and bearing assembly being serviced without disturbing piping connections, pump volute or motor.

2. Pumps volute shall be Class 30 cast iron with integrally-cast pedestal support feet, suitable for 175 psi working pressure. The pump volute shall be supplied with plugged vent, drain, and gauge tappings. Pumps shall be capable of withstanding a horizontal load of 0.5 G without adversely affecting pump operation.

3. The impeller shall be cast bronze, enclosed, single suction type, dynamically balanced, keyed to the shaft and secured by a locking cap screw. The allowable residual unbalance in the impeller rotating assembly shall conform to ANSI Grade G6.3.

4. The liquid cavity of the pump shall be sealed off at the shaft by an internally-flushed mechanical seal with ceramic seal seat of at least 98% alumina oxide and hardness of 68 Rockwell C, or a tensile strength of 300,000 psi, and carbon seal ring, suitable for continuous operation at 225°F. The seals and bearings shall be capable of being serviced without disconnecting the pump from piping or disturbing the volute or motor to maintain original alignment. A replaceable bronze shaft sleeve shall completely cover the wetted area under the seal. A stuffing box mechanical seal design with longer span between the impeller centerline and first bearing will not be allowed.

5. Pump bearing housing assembly shall have heavy-duty re-greaseable ball bearings, replaceable without disturbing piping connections and have support at coupling end.

6. Base plate shall be of structural steel or fabricated steel channel configuration fully enclosed at sides and ends, with securely welded cross members and fully open grouting area. A flexible-type spacer design coupler, capable of absorbing torsional vibration, shall be employed between the pump and motor. Coupler shall be shielded by a suitable coupler guard securely fastened to the base.

7. Motor shall meet EPACT 92 requirements and NEMA specifications and shall be of the size and voltage called for on the plans. Provide totally enclosed fan cooled motors for all pumps. Pump and motor shall be factory aligned, and shall be realigned by mechanical contractor or by an alignment service contractor to factory recommendation.

8. Each pump shall be factory tested per Hydraulic Institute standards. It shall then be thoroughly cleaned and painted with at least one coat of high grade machinery enamel prior to shipment.

9. Pump Motor - see Electrical Section 2.6.

2.5 ELECTRICAL REQUIREMENTS

A. Introduction

1. This specification contains general electrical requirements for equipment and should be considered as an integral part of the specification that it accompanies. Should any discrepancies occur between this specification and the accompanying equipment specification, the purchaser shall be the sole party responsible for clarifying the discrepancies.

B. Scope

1. All electrical work shall meet the standards of the latest issue of the NEC, and shall comply with applicable state and municipal laws, and local plant safety regulations covering each class of work.

2. All electrical controls and control panels shall be located where accessible and, preferably, at grade.

3. Cables and conductors shall be sized in accordance with the National Electrical Code (NEC), based on the current-carrying capacity, voltage-drop considerations, short circuit rating, and derating due to heating effects.

4. Electrical power will be supplied at 480 Volt AC +10%, 3 phase, 3 wire, 60 hertz.

C. General Requirements

1. All motors, electrical equipment and control devices shall be designed and manufactured to conform to all applicable requirements of the latest editions of the code and standards as specified in the attached process specification.

2. Unless specifically noted, all electrical and electronic accessories supplied by the Vendor shall have suitable enclosures and connection boxes for the unit’s electrical classification. They must also be listed and labeled with a minimum of one of the electrical listing agencies in the attached process specification.

3. All electrical equipment shall be UL listed for its application and shall be stamped with this approval.

4. Where conflicts occur among the codes, ordinances, standards, and specifications, more restrictive requirements shall govern.

D. Motors

1. The Vendor shall provide with their quotation the motor design requirements necessary to provide adequate operation as required by this specification. The motor design requirements shall include at a minimum the following:

a. Motor horsepower.
b. Motor speed.
c. Motor torque.
d. Range of motor frame sizes and mounting sizes easily adapted for each drive.
e. Motor voltage

2. Motors greater than 1/2 HP shall be 480 volts, 3-phase, 60 hertz. Motors 1/2 HP or smaller shall be 120 volt, single phase, 60 hertz.

3. All motors will be designed and manufactured such as to conform to all applicable requirements of the latest editions of standards published by NEC, ANSI, IEEE, NFPA, and NEMA MG-1 standard.

4. All motors shall be premium efficiency. When the motor is operating at rated voltage and frequency, the minimum full load efficiency shall equal or exceed the nominal values in NEMA Standards Publications # MG1-1998 and efficiencies list in this specification.

5. Motors shall be of the squirrel cage, induction type and shall be capable of starting and accelerating their load to normal operating speeds under the most severe conditions likely to be encountered without exceeding the horsepower rating indicated on the nameplate; and without usurping any portion of any specified service.

6. Speed and torque characteristics shall conform to NEMA Design B requirements. When speed and torque characteristics other than NEMA Design B are required, the bidder's proposal shall clearly indicate such requirements, and the motor shall have speed and torque characteristics, which will satisfy the requirements. Unless otherwise specified or required, motors shall have a Service Factor of 1.15, except inverter duty motors shall have a service factor of 1.0.

7. TEFC & ODP motors shall be rated for “mill and chemical duty”.

8. Motors shall have NEMA Class F insulation minimum.

9. Motor nameplates shall be of stainless steel and shall be permanently fastened with stainless steel fasteners.

10. Seals shall be used to retain grease and to protect bearings from dust.

11. Motors shall have grease lubricated ball or roller bearings capable of in service lubrication. Bearings shall be of such design to provide extra long life. Permanently lubricated bearings will not be acceptable. Grease fittings shall be easily accessible and not interfere with machine operation.

12. All motors shall be designed for continuous duty and shall not exceed the temperature rises indicated for each insulation class, in NEMA Standards Publication MG1-1998.

13. Copper conductors shall be used for windings.

14. To provide resistance to chemical corrosion, no aluminum parts of the motor shall be exposed to the atmosphere.

15. For motors 10 HP and larger, the locked rotor kVA/HP shall not exceed locked rotor code letter “G” (5.6 – 6.29 kVA/HP).

16. A spring-loaded cap shall be installed on the outlet of each bearing grease chamber discharge port. Grease fittings shall be supplied on inlet grease connections.

17. Motors operating with VFDs shall be UL rated for Inverter Duty and shall meet all requirements Part 31 of NEMA standard MG1-1998 for Inverter-Fed Polyphase Motors.

18. The motor shall be suitable for operation in the environment indicated in the data sheet(s).

19. Motors for use in areas subject to washdown shall be suitable for wet or washdown locations.

TOTALLY ENCLOSED FAN-COOLED MOTORS (TEFC)			
	1200 RPM	1800 RPM	3600 RPM
Motor HP	Minimum Efficiency (%)	Minimum Efficiency (%)	Minimum Efficiency (%)
2	88.5	86.5	86.5
3	89.5	89.5	88.5
5	89.5	89.5	89.5
7.5	91.7	91.7	91.0
10	91.7	91.7	91.7
15	92.4	92.4	91.7
20	92.4	93.0	92.4
25	93.0	93.6	93.0
30	93.6	93.6	93.0
40	94.1	94.1	93.6
50	94.1	94.5	94.1
60	94.5	95.0	94.1
75	95.0	95.4	94.5
100	95.4	95.4	95.0
125	95.4	95.4	95.4
150	95.8	95.8	95.4

3.0 EXECUTION

3.1 INSTALLATION

A. All items under this Section shall be installed in strict accordance with the manufacturer’s recommendations.

B. Provide drains for bases and stuffing boxes piped to and discharging into floor drains, per OSHA requirements.

C. Provide air cock and drain connection on horizontal pump casings.

D. Support piping adjacent to pump such that no weight is carried on pump casings. Provide supports under elbows on pump suction and discharge line sizes 4 inches (102 mm) and over.

E. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in operation, operate between 34% to the left and 15% to the right of the published best efficiency curve.

+ + END OF SECTION 237000 + +

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1.0 GENERAL REQUIREMENTS

1.1 SCOPE OF WORK

A. Provide complete seamless integrated system for control of all new HVAC equipment as indicated on the contract documents. All systems shall be provided directly by the manufacturer or by a dealer licensed by the manufacturer. The manufacturer must provide full support to the licensed dealer throughout the guarantee period.

B. The DDC controls shall perform all sequences of operation which may be listed on control drawings or attached to this specification. The controls shall be capable of proportional-integral-derivative (PID) control. Pneumatic components shall be fully proportioning unless otherwise noted. Controls supplier shall provide all devices, wiring and interlocks necessary to completely perform sequences whether such devices are explicitly shown on the drawings, specified, or not shown or specified.

C. This BMS Subcontractor shall provide panel enclosures to house all controllers, relays and control devices necessary for a fully functioning control system.

D. This BMS Subcontractor shall coordinate with the mechanical and balancing contractor to meet all start-up and commissioning requirements.

E. Certify maintenance of local office to job site staffed with factory trained engineers capable of providing instructions to Owner's personnel and perform routine and emergency maintenance on all system components.

F. Provide and install all control devices as indicated on the HVAC control diagrams located on the contract documents.

G. Provide the services of control manufacturer’s representative to be on site during installation and during the entire time that the startup, testing and balancing procedures detailed in other sections take place. The representative shall be part of the manufacturer's service organization and shall be skilled in the adjustment and calibration of all control devices as well as being capable of modifying and checking system software.

H. This BMS Subcontractor shall furnish and install actuators for all dampers including all classroom unit ventilators. Dampers to be provided by the sheet metal subcontractor.

I. This BMS Subcontractor shall furnish all control valves and actuators for installation by piping Subcontractor.

J. Subcontractor shall assist testing and balancing contractor as required completing balancing work.

K. Subcontractor shall provide commissioning services as required to meet requirements of this specification.

L. All valve and damper actuators shall be electronic.

M. The BMS Subcontractor shall be responsible for all 120v power wiring required for any new or existing BMS control devices. This shall include connecting into the power panel and providing (if needed) new circuit breakers. All power wiring to be ran in conduit.

N. Installation of new data drops as needed.

O. Provide and install new VFD's as indicated on the contract documents. For new VFD's new power wiring shall be by the Electrical Sub-Contractor. For VFD's that replace existing starters, this electrical work shall be performed by the ATC sub-contractors licensed electrician sub.

P. Include as part of the project bid any new software upgrades needed.

Q. Include as part of this project any new major front end type equipment (DDC panels, main DDC controllers, etc.) needed to fully integrate all the new and existing equipment into the RIC campus wide Siemens control system.

S. Provide and Install new refrigerant leak detection system as indicated on the contract drawings and specified herein. Detection system shall be Mine Safety Appliances Company Chillgard 5000 refrigerant monitor.

1.2 RELATED SECTIONS

A. The following sections also constitute related work:

1. HVAC Drawings

2. Electrical Drawings

1.3 RELATED WORK BY OTHERS

A. All cutting, patching and painting is by others.

B. The BMS Subcontractor shall cooperate with other subcontractors performing work on this project to achieve a complete and neat installation. To that end, each subcontractor shall consult the drawings and specifications for all trades to determine the nature and extent of others' work.

C. Electrical Subcontractor shall provide:

1. Wiring of smoke detectors to the building fire alarm system. BMS Subcontractor to hardwire to fan shut down.

D. Motorized control dampers shall be provided and installed by the sheet metal subcontractor. Actuator is to be provided and installed by the BMS subcontractor.

1.4 WARRANTY OF SYSTEM

A. Provide controls supplier's warranty of performance of entire system as required by Contract documents. Performance and components requirements are established by control sequences and diagrams on Drawings and by this Paragraph.

B. The Subcontractor shall guarantee the controls to be free from defects in material and workmanship and guarantee performance of systems as required by Contract Documents for one year of normal use and service beginning on date Owner begins to receive beneficial use of system and system has been accepted.

C. At the end of the final start-up/testing, if equipment and systems are operating satisfactorily to the Owner and the engineer, the Owner shall sign certificates certifying that the control system's operation has been tested and accepted in accordance with the terms of this specification. The date of Owner's acceptance shall be the start of warranty.

D. Control system failure during the warranty period shall be adjusted, repaired or replaced at no charge or reduction in service to the owner.

1.5 OWNERSHIP OF PROPRIETARY MATERIAL

A. All project developed hardware and software shall become the property of the Owner. These include but are not limited to:

1. Project graphic images

2. Record drawings

3. Project database

4. Job-specific application programming code

5. All documentation

1.6 SUBMITTALS

A. Subcontractor shall provide shop drawings and manufacturers' standard specification data sheets on all hardware and software to be provided. No work may begin on any segment of this project until submittals have been reviewed by the engineer or conformity with the plan and specifications.

B. All shop drawings shall be prepared in AutoCAD software compatible with AutoCAD 2010. In addition to the drawings, the Subcontractor shall furnish a CD containing the identical information. Drawings shall be B size or larger.

C. Shop drawings shall include a riser diagram depicting locations of all controllers and workstations with associated network wiring. Also included shall be individual schematics of each mechanical system showing all connected points with reference to their associated controller. Typicals will be allowed where appropriate.

D. Submittal data shall contain manufacturer's data on all hardware and software products required by the specification. Valve, damper and air flow station schedules shall indicate size, configuration, capacity and location of all equipment.

E. Software submittals shall contain narrative descriptions of sequences of operation, program listings, point lists, and a complete description of the graphics, reports, alarms and configuration to be furnished with the workstation software. Information shall be bound or in a three ring binder with an index and tabs.

F. Submit six (6) copies of submittal data and shop drawings (including all system graphics) to the engineer for review prior to ordering or fabrication of the equipment. The Subcontractor prior to submitting shall check all documents for accuracy.

G. The engineer will make corrections, if required, and return to the subcontractor. The subcontractor will then resubmit with the corrected or additional data. This procedure shall

be repeated until all corrections are made to the satisfaction of the engineer and the submittals are fully approved.

H. Quantities of devices submitted shall be reviewed by the engineer and Owner. Such review shall not relieve the subcontractor from furnishing quantities required for completion.

I. Provide the engineer and Owner any additional information or data which is deemed necessary to determine compliance with these specifications or which is deemed valuable in documenting the system to be installed.

J. Project Record Documents: Upon completion of installation submit three (3) hard copies of record (as-built) documents and on CD where applicable. The documents shall be submitted for approval prior to final completion and include:

1. Project Record Drawings - These shall be as-built versions of the submittal shop drawings. One set of CDs including CAD drawing files shall also be provided.

2. Testing and Commissioning Reports and Checklists.

3. Operating and Maintenance (O & M) Manual - These shall be as-built versions of the submittal product data. In addition to that required for the submittals, the O & M package shall include:

a. Names, address and 24-hour telephone numbers of Subcontractors installing equipment, and the control systems and service representative of each.

b. Operators Manual with procedures of operating the control systems including logging on/off, alarm handling, producing point reports, trending data, overriding computer control, and changing set points and other variables.

c. Programming Manual with a description of the programming language including syntax, statement descriptions including algorithms and calculations used, point database creation and modification, program creation and modification, and use of the editor.

d. Engineering, Installation and Maintenance Manual(s) that explains how to design and install new points, panels, and other hardware; preventative maintenance and calibration procedures; how to debug hardware problems; and how to repair or replace hardware.

e. A listing and documentation of all custom software created using the programming language including the point database. One set of CDs containing files of the software, and required utilities, database shall also be provided

f. One set of CDs containing files of all color-graphic screens created for the project.

g. A list of recommended spare parts with part numbers and supplier.

h. Complete original issue documentation, installation and maintenance information for all third party hardware provided including computer equipment and sensors.

i. Complete original issue CDs for all software provided including operating systems, programming language, operator work-station software, and graphics software.

j. Licenses, Guarantee, and Warrantee documents for all equipment, software and systems.

k. Recommended preventive maintenance procedures for all system components including a schedule of tasks (inspection, cleaning, calibration, etc.), time between tasks, and task descriptions.

l. This documentation shall include specific part numbers and software versions and dates. A complete list of recommended spare parts shall be included with the lead time and expected frequency of use of each part clearly identified.

K. Training Manuals: The Subcontractor shall provide a course outline and training manuals for all training classes at least six weeks prior to the first class. The Owner reserves the right to modify any or all of the training course outline and training materials. Review and approval by Owner and
Engineer and shall be completed at least three weeks prior to first class. 40 hours classroom instruction shall be provided.

1.7 CODE COMPLIANCE

A. Provide BMS components and ancillary equipment, which are UL-916 listed and labeled.

B. All equipment or piping used in conditioned air streams, spaces or return air plenums shall comply with NFPA 90A Flame/Smoke/Fuel contribution rating of 25/50/0 and all applicable building codes or requirements.

C. All wiring shall conform to the National Electrical Code, NFPA 70.

D. All smoke dampers shall be rated in accordance with UL 555S.

E. Comply with FCC rules, Part 15 regarding Class A radiation for computing devices and low power communication equipment operating in commercial environments.

F. Comply with FCC, Part 68 rules for telephone modems and data sets.

1.8 PROGRAMMED MAINTENANCE AND STARTUP

A. Start system and perform necessary testing and debugging. Perform acceptance test in presence of Owners representative and Engineer. Provide a 15 day notice before acceptance test. Notice shall certify that system is complete and operates as required by Contract Documents. When system performance is deemed satisfactory, system parts will be accepted for beneficial use and warranty shall begin.

1.9 QUALITY ASSURANCE

A. System Installer Qualifications

1. The Installer shall have an established working relationship with the Control System Manufacturer of not less than three years.

2. The Installer shall have successfully completed Control System Manufacturer's classes on the control system. The Installer shall present for review the certification of completed training including the hours of instruction and course outlines upon request.

3. The installer shall provide 24 hour response in the event of a customer call.

4. All installers must be building automation subcontractors in the business of installing direct digital control building automation systems for a minimum of 3 years along with being a Johnson controls branch, dealer and authorized control specialist.

5. All installers must be authorized distributors or branch offices of the manufacturers specified.

6. All installers must have a trained staff of application engineers who have been certified by the manufacturer in the configuration, programming and service of the automation system.

7. All products used in this installation shall be new, currently under manufacture, and shall be applied in similar installations for a minimum of two years. This installation shall not be used as a test site for any new products unless explicitly approved by the Owner's representative in writing prior to bid date. Spare parts shall be available for at least five years after completion of this contract.

B. Codes and Standards: Meet requirements of all applicable standards and codes, except when more detailed or stringent requirements are indicated by the Contract Documents, including requirements of this Section.

1. Underwriters Laboratories: Products shall be UL-916-PAZX listed.

2. National Electrical Code -- NFPA 70.

3. Federal Communications Commission -- Part J.

1.10 EQUIPMENT IO&M MANUALS

A. On completion and acceptance of the work, furnish for approval three copies of written instructions on the proper Installation, Operation and Maintenance of all equipment and apparatus furnished under this section.

B. Each manual shall be provided with an index sheet listing the contents in alphabetical order and shall contain but not be limited to the following material:

1. Updated copies of all submittal data and shop drawings as specified previously.

2. Manufacturer's instructions regarding the installation, maintenance and calibration of each component used in the ATC system installed by Subcontractor.

3. Copies of all warranties and guarantees issued by each equipment manufacturer.

4. "As-built" interconnecting wiring diagrams and wire lists of the field installed system with complete and properly identified numbering of each system component and device.

5. A set of “User Manuals” detailing the operation of the control systems. The manual shall describe the hardware operation as well as provide instructions in computer access and programming. This manual shall be submitted under separate cover. The User Manual shall be written for an inexperienced user. It shall describe in layman’s language, the functions and procedures of “using” the system.

1.11 ACCEPTANCE TESTING

A. At substantial completion of the work, this Subcontractor shall prepare a punch list of all items remaining to be completed or corrected. The failure to include any items on such list does not alter the responsibility of this Subcontractor to complete all work in accordance with the contract documents. This list shall be delivered to the Owner prior to Subcontractor's request for formal acceptance testing.

B. Acceptance Test Procedure:

1. This Subcontractor shall demonstrate in the presence of the Owner that all functions of the control systems are operating as specified in the contract documents, including any required change orders. The final checkout will include, but not be limited to, the following items:

a. Provide hard copy of fully annotated program (PPLC) with comment lines for review and approval.

b. Verification of the location, calibration and proper wiring/connection of all input and output devices.

c. The proper operation and calibration of all ATC devices and actuators shall be verified individually.

d. When system performance is deemed satisfactory, system parts shall be accepted for beneficial use. Warranty shall begin. All minor deficiencies found will be noted in writing by the Owner. This Subcontractor shall correct all deficiencies so noted before the final acceptance will be issued.

1.12 COORDINATION

A. The HVAC Subcontractor shall assume full responsibility for the coordination of the work of this section with that of the refrigeration, heating, and air distribution systems sections to accomplish the requirements of space conditioning as indicated on the construction drawings and as specified. The control manufacturer shall furnish, install, supervise, and test the field wiring associated with the work of this section and shall be responsible to coordinate the installation of controls with HVAC Subcontractor.

B. The Automatic Temperature Control System manufacturer shall coordinate the locations of desired items such as access doors, size of instrument holes, conduits/wiring, or other devices in the ductwork, piping, and plenums with the HVAC Subcontractor.

1.13 DELIVERY, STORAGE & HANDLING

A. All materials shall be inspected for size, quality, and quantity against approved shop drawings upon delivery

B. All materials and spare parts shall be packed, labeled, and stored in a covered dry location until time of installation.

1.14 ENVIRONMENT

A. All components, including data processing equipment, shall be suitable for operating in a normal plant environment without requirements for special temperature and humidity control.

2.0 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Siemens

B. Wholesale distributors will not be acceptable.

2.2 SENSORS AND POINT HARDWARE

A. General:

1. When providing instruments with 4-20 mA transmitters, conversion to voltage is required. Controls contractor shall provide 250 ohm 0.1% precision resistor.

2. Analog pneumatic outputs (3-15 psi) shall be produced by an analog output controlling a dedicated electronic to pneumatic transducer which is separately mounted in the field device section of the enclosure for ease of field replacement. The electronic to pneumatic transducer shall be a separate device which is not printed circuit card mounted.

3. Analog outputs should be linear variable outputs. If the Subcontractor uses the mode of operation for analog output which incorporates "pulse band width modulation" then the "pulse band width modulated" signal shall be converted through a "pulse band width to analog output transducer" which then provides output to the final control element to eliminate an inherent offset that can occur in mechanical electrical "floating control" type control loops.

4. Miscellaneous devices – provide all necessary relays, limit switches, postioners, valves, clocks, transformers, etc, to make a complete and operable system. Locate these devices on local ATC panel unless specified otherwise.

5. Name Tags – All sensing devices, transmitters, controllers, not mounted in a clearly labeled panel, or which are not part of a clearly labeled device, shall be provided with an engraved plastic plate containing the name, function, and system or system number for the device.

6. Set points on thermostats and temperature controllers shown on the drawings are indicative only and devices shall be adjustable above and below such setpoints. If a setpoint is not stated, the control range of the devices shall be suitable for the intended service. Range of devices shall be approximately 50 percent greater in both directions than the span of variable, with a minimum of 25 degrees and a maximum of 100 degrees F for air systems.

7. Thermometers – Thermometers shall be flush mounted on local panels. These thermometers shall be of the dial type, minimum 3” diameter.

8. Where required to prevent nuisance shut downs of the systems, provide time delay of sensors to allow system start up before the sensors are activated. This would include, but not limited to low temperature freeze protection on 100 percent outdoor air units.

9. Where control sequences refer to activation of an alarm indicator, it will be understood to mean activation of a labeled pilot light at the local ATC panel. A dedicated pilot light will be provided for each alarm unless a common alarm light is specified.

B. Alarms:

1. Alarm contacts shall be wired normally closed (NC). If equipment only has normally open (NO) contacts, provide an intervening relay that will have NC contacts which shall open via the NO relay. When in alarm condition or if wire to contact is opened (say wire cut in field), shall sense condition and generate alarm.

2. Common alarms shall be wired to alarm terminals on manufacturer's control panel.

3. Priority levels shall be provided for alarms, and alarm messages shall allow different levels for message outputs.

C. Sensor Requirements:

1. Temperature Sensors and Transmitters:

a. Temperature sensors shall conform to the following minimum standards. Additional specifications are given for specific applications below.

- Sensors shall be accurate to ±0.5°F over minimum operating ranges.

- Sensor, associated circuitry and readout shall have minimum resolution of 0.5°F.

- Sensors shall withstand ambient temperatures of –30°F to 240°F, but performance requirements must be met only for ranges specified.

b. Provide 1,000 ohm platinum resistance temperature device (RTD) sensors, and wall mounted space temperature sensors with 40˚F to 100°F range.

D. Current Transducers/Sensors:

a. For equipment status, provide analog current sensing sensors. Sensors shall be capable of producing analog current value proportional to equipment current load. Current switches shall be self-powered, solid state with adjustable trip current.

b. Sensors shall be accurate to ±3% of full scale current.

c. Sensors shall be capable of reading 125% of full load amps (FLA).

E. Relays

a. Control relays shall be UL listed plug-in type with dust cover. Contact rating, configuration, and coil voltage suitable for application.

b. Time delay relays shall be UL listed solid-state plug-in type with adjustable time delay. Delay shall be adjustable plus or minus 200% (minimum) from set-point shown on plans. Contact rating, configuration, and coil voltage suitable for application. Provide NEMA Type 1 enclosure when not installed in local control panel.

F. Transformers and Power Supplies

a. Control transformers shall be UL listed, Class 2 current-limiting type, or shall be furnished with over-current protection in both primary and secondary circuits for Class 2 service.

b. Unit output shall match the required output current and voltage requirements. Current output shall allow for a 50% safety factor. Output ripple shall be 3.0 mV maximum Peak-to-Peak. Regulation shall be 0.10% line and load combined, with 50 microsecond response time for 50% load changes. Unit shall have built-in over-voltage protection.

c. Unit shall operate between 0 C and 50 C.

d. Unit shall be UL recognized.

G. Pressure Differential Switches

1. Provide remote indication of pressure differential at the local control panel for each new AHU and exhaust fan. The units shall be able to withstand an over pressure of 10 psi. Units shall have zero and span adjustments. The transmitters shall be equal to a Serta model 264, 0-3” W.C. differential range 4-20 mA or 0 to 5 VDC output, ½” conduit enclosures with an accuracy of ±1% FS.

2.3 STAND ALONE DIGITAL CONTROL UNITS

A. General:

1. Standalone Digital Control Units (SDCUs) shall provide control of HVAC air handling units and exhaust fans. Each controller shall have its own control programs and will continue to operate in a safe and controlled manner in the event of a failure or communication loss to the building network.

2. The SDCU shall be an installed in a 24”x36” NEMA 2 enclosure with built in local status display and graphical configuration software.

3. SDCUs shall include all point inputs and outputs necessary to perform the specified control sequences. Analog outputs shall be industry standard signals such as 24V floating control, 3-15 psi pneumatic, 0-10v, allowing for interface to a variety of modulating actuators.

4. Environment: The hardware shall be suitable for the anticipated ambient and electrical classification conditions. Controller used in conditioned ambient shall be mounted in dust-proof enclosures, and shall be rated for operation at 32°F to 120°F (0°C to 50°C).

5. Serviceability: Provide diagnostic LEDs for power, and communications. All wiring connections shall be made to field removable, modular terminal strips or to a termination card connected by a ribbon cable.

6. Immunity to power and noise. Controller shall be able to operate at 90% to 110% of nominal voltage rating and shall perform an orderly shut-down below 80%.

7. Transformer. Power supply for the ASC must be rated at minimum of 125% of ASC power consumption, and shall be fused or current limiting type.

B. Memory:

1. Control programs shall be stored in battery backed-up RAM and EPROM. Each controller shall have a minimum of 32K bytes of user RAM memory and 128K bytes of EPROM. SDCUs shall maintain all BIOS and programming information in the event of a power loss for at least 60 days.

C. Communication Ports:

1. SDCUs shall provide a N2 communication port to the field bus. In addition, a port shall be provided for connection of a portable service tool to support local commissioning and parameter changes with or without the NCU online. It shall be possible from a service port on any SDCU to view, enable/disable, and modify values of any point or program on any controller on the local field bus, any NCU or any SDCU on a different field bus.

D. Input/Output:

1. Each SDCU shall support the addition of the following types of inputs and outputs:

- Digital Inputs for status/alarm contacts
- Counter Inputs for summing pulses from meters.
- Thermistor Inputs for measuring temperatures in space, ducts and thermowells.
- Analog inputs for pressure, humidity, flow and position measurements.
- Digital Outputs for on/off equipment control.
- Analog Outputs for valve and damper position control and capacity control of primary equipment.

E. Expandability:

1. Input and output capacity shall be expandable through the use of plug-in modules. A minimum of two modules shall be added to the base SDCU before additional power is required.

F. Networking:

1. Each SDCU will be able to exchange information on a peer to peer basis with other Standalone Digital Control Units during each field bus scan. Each SDCU shall be capable of storing and referencing global variables (on the LAN) with or without any workstations online. Each SDCU shall be able to have its program viewed and/or enabled/disabled either locally through a portable service tool or through a workstation connected to an NCU.

G. Indicator Lamps:

1. SDCUs will have as a minimum, LED indication of CPU status, and field bus status.

H. Real Time Clock (RTC):

1. An SDCU shall have a real time clock in either hardware or software. The accuracy shall be within 10 seconds per day. The RTC shall provide the following information: time of day, day, month, year, and day of week. Each SDCU shall receive a signal, every hour, over the network from the NCU which synchronizes all SDCU real time clocks.

I. Automatic Restart After Power Failure:

1. Upon restoration of power, the SDCU shall automatically and without human intervention, update all monitored functions, resume operation based on current, synchronized time and status, and implement special start-up strategies as required.

J. Battery Back Up:

1. Each SDCU shall have at least 3 years of battery backup to maintain all volatile memory.

K. Alarm Management:

1. For each system point, alarms can be created based on high/low limits or conditional expressions. All alarms will be tested each scan of the SDCU and can result in the display of one or more alarm messages or reports.

2. Up to 8 alarms can be configured for each point in the controller enabling the escalation of the alarm priority (urgency) based upon which alarm(s) is/are triggered.

3. Alarm messages can be sent to a local terminal or modem connected to an NCU or to the Operator's Workstation(s).

4. Alarms will be generated based on their priority. A minimum of 255 priority levels shall be provided.

5. If communication with the NCU is temporarily interrupted, the alarm will be buffered in the SDCU. When communications return, the alarm will be transmitted to the NCU if the point is still in the alarm condition.

L. Details of each ATC panel shall be submitted for approval prior to fabrication. Locations of each panel are to be convenient for adjustment and service. Provide nameplates that are engraved beneath each panel mounted control device clearly describing the function of said device and range of operation. All manual switches, digital readouts, and dial thermometers shall be flush mounted on the hinged door, with permanent labels showing the function of each item. All other devices shall be located within the cabinet mounted to a sub panel.

M. All electrical devices within the panels shall be factory pre-wired to a

numbered terminal strip. All wiring within the panel shall be in accordance with NEMA and UL standards and shall meet all local codes.

N. All panels shall be provided with lugs and brackets to allow the panel to be firmly fastened to the structure. The lugs and brackets shall be sized to withstand the expected seismic loads for the area and type of application.

O. Provide 110 volt power receptacle in each panel.

P. Provide a copy of the wiring and control diagram for all work in each panel. The diagram is to be stored in a pocket on the door.

Q. Provide a swing down or slide out shelf to support a lap top computer or other portable interface device.

2.4 FIELD DEVICES

A. Electronic damper/valve actuators.

1. The actuator shall have electronic overload or digital rotation sensing circuitry to prevent damage to the actuator throughout the rotation of the actuator.

2. Where shown, for power-failure/safety applications, an internal mechanical, spring return mechanism shall be built into the actuator housing.

3. All rotary spring return actuators shall be capable of both clockwise and counter clockwise spring return operation. Linear actuators shall spring return to the retracted position.

4. Proportional actuators shall accept a 0-10 VDC or 0-20 ma control signal and provide a 2-10 VDC or 4-20 ma operating range.

5. All 24 VAC/DC actuators shall operate on Class 2 wiring and shall not require more than 10 VA for AC or more than 8 W for DC applications. Actuators operating on 120 VAC or 230 VAC shall not required more than 11 VA.

6. All non-spring return actuators shall have an external manual gear release to allow manual positioning of the damper when the actuator is not powered. Spring return actuators with more than 60 in-lb. torque capacity shall have a manual crank for this purpose.

7. All modulating actuators shall have an external, built-in switch to allow the reversing of direction of rotation

8. Actuators shall be provided with a conduit fitting and a minimum 1m electrical cable and shall be pre-wired to eliminate the necessity of opening the actuator housing to make electrical connections.

9. Actuators shall be Underwriters Laboratories Standard 873 listed. All actuators should conform to UL approval.

10. Actuators shall be designed for a minimum of 60,000 full stroke cycles at the actuator's rated torque.

11. Actuators to be provided with limit switches to ensure action/position achieved.

12. Actuators shall be equal to Belimo

B. Control Valves

1. Control valves shall be two-way type for modulating service as scheduled or shown. Control valves shall be equal to or a maximum of one size smaller than the line size it is installed on.

2. Close-off (differential) Pressure Rating: Valve actuator and trim shall be furnished to provide the following minimum close-off pressure ratings:

a. Water Valves:

1) Two-way: 150% of total system (pump) head.

3. Water Valves:

a. Body and trim style and materials shall be per manufacturer's recommendations for design conditions and service shown, with equal percentage ports for modulating service. All valves and actuators shall be manufactured by Belimo.

b. Sizing Criteria:

1) Two-position service: Line size.

2) Two-way modulating service: Pressure drop shall be equal to twice the pressure drop through heat exchanger (load), 50% of the pressure difference between supply and return mains, or 5 psi, whichever is greater.

3) Valves 1/2" through 2" shall be bronze body or cast brass ANSI Class 150, spring loaded, Teflon packing, quick opening for two-position service. Two-way valves to have replaceable composition disc, or stainless steel ball.

4) 2-1/2" - 6" valves and larger shall be cast iron globe style ANSI Class 150 with guided plug, Teflon packing, and 316 stainless steel stem.

c. Water valves shall fail normally open or closed as scheduled on plans or as follows:

1) Hot water zone valves - normally open

2) Heating coils in air handlers - normally open.

C. Temperature Sensors

1. Space temperature sensors shall be manufacturer’s standard RTD.

a. Sensors shall have liquid crytsal display for both setpoint and space temperature along with unoccupied/occupied override switch and communication port for connection to laptop. Adjustment capability shall be provided but limited by maximum and minimum settings ±4°F (adjustable) by programming at the DDC Controller.

b. Temperature sensors location and type shall be approved by the Owner/Engineer before installation.

2. Duct sensors shall be rigid or averaging as shown. Averaging sensors shall be a minimum of 5 feet (1.5m) in length.

3. Immersion sensors shall be provided with a separable 316 stainless steel well. Pressure rating of well is to be consistent with the system pressure in which it is to be installed. Provide with 316 S.S. RTD probe and extension, spring loaded probe and aluminum construction head.

4. Provide matched temperature sensors for differential temperature measurement. Differential accuracy shall be within 0.2 F (0.1 C).

5.

Temperature monitoring range	+20/120°F (-13° to 49°C)
Output signal	Changing resistance
Accuracy at Calibration point	±0.5°F (+/- 0.3°C)
Set Point and Display Range	55 to 95°F (13° to 35°C)

6. Liquid immersion temperature:

Temperature monitoring range	+30/250°F (-1°/121°C)
Output signal	Changing resistance
Accuracy at Calibration point	±0.5°F (+/-0.3°C)

7. Duct (single point) temperature:

Temperature monitoring range	+20/200°F (-7°/49°C)
Output signal	Changing resistance
Accuracy at Calibration point	±0.5°F (+/-0.3°C)

8. Duct Average temperature:

Temperature monitoring range	+20° ±120°F(-7°/+49°C)
Output signal	4 – 20 mA DC
Accuracy at Calibration point	±0.5°F (±03°C)
Sensor Probe Length	25' L (7.3m)

9. Outdoor Air Temperature Sensor:

a. Platinum RTD sensing element type with S.S. sun shield and an accuracy of ±0.75°F

D. Liquid Differential Pressure Transmitter:

Ranges/Heating	0-5/30 inches H20 0-25/150 inches H20 0-125/750 inches H20
Output	4 – 20 mA DC
Calibration Adjustments	Zero and span
Accuracy	± 0.2% of span
Linearity	± 0.1% of span
Hysteresis	± 0.05% of span

E. Differential pressure:

1. Unit for fluid flow proof shall be:

Range	8 to 70 psi
Differential	3 psi
Maximum differential pressure	200 psi
Maximum pressure	325 psi

2. Unit for air flow shall be:

Set point ranges:	0.5" WG to 1.0" WG
	1.0" WG to 12.0" WG

F. Static pressure sensor:

Range	0 to .5" WG
	0 to 1" WG
	0 to 2" WG
	0 to 5" WG
	0 to 10" WG
Output Signal	4 – 20 mA DC
Combined static error	0.5% full range
Operating Temperature	-40º to 175º F

G. Air Pressure Sensor:

Range:	0 to 0.1 in. water
	0 to 0.25 in. water
	0 to 0.5 in. water
	0 to 1.0 in. water
	0 to 2.0 in water
	0 to 5.0 in. water
	0 to 10.0 in. water
Output signal	4 to 20 mA
Accuracy	±1.0% of full scale

H. Humidity Sensors

1. Duct and room sensors shall have a sensing range of 20% to 80% with accuracy of ±5% R.H.

2. Duct sensors shall be provided with a sampling chamber.

3. Outdoor air humidity sensors shall have a sensing range of 20% to 100% R.H. It shall be suitable for ambient conditions of -5º F to 170º F(- C to 75º C).

4. Humidity sensor's drift shall not exceed 1% of full scale per year.

I. Pressure to Current Transducer:

Range	3 to 15 psig (21 to 103 kPa) or
	3 to 30 psig (21 to 207 kPa)
Output signal	4 – 20 mA
Accuracy	±1% of full scale (± 0.3 psig)

J. Control Valves:

1. Electric Control

Rangeability	40:1
Flow Characteristics	Modified. Equal percentage
Control Action	Normal open or closed as selected
Medium	Steam, water, glycol
Body Type	Screwed ends 2" and smaller, flanged Valves 2-1/2" and larger
Body Material	Bronze
Body Trim	Bronze
Stem	Stainless Steel
Actuator	0-10 VDC, 4-20 MA or 2 position 24 VAC/120VAC

K. Pressure to Current Transducer

1. Transducer shall accept a standard 4-20 mA current input signal and provide a proportional 3-15 psig pneumatic signal. Device shall have an integral manual override adjustment knob with output pressure gauge.

L. Low Temperature Detectors (Freezestats):

1. Install low temperature averaging type detectors as indicated and provide protection for every square foot of coil surface area with one linear foot of element per square foot of coil.

   a. Upon detection of low temperature, the low temperature detectors shall stop the associated supply fans and return the automatic dampers to their normal position. Provide with automatic reset.

M. High Temperature Detectors:

1. Provide manual reset, fixed temperature line voltage type with a bi-metal actuated switch.

   a. Switch shall have adequate rating for required load.

N. Current Sensing Relay:

1. Provide solid-state, adjustable, current operated relay. Provide a relay which changes switch contact state in response to an adjustable set point value of current in the monitored A/C circuit.

2. Adjust the relay switch point so that the relay responds to motor operation under load as an “on” state and so that the relay responds to an unloaded running motor as an “off” state. A motor with a broken belt is considered an unloaded motor.

3. Provide for status device for all fans and pumps

O. Insertion Flow Meters:

Sensing Method	Impedance Sensing
Accuracy	±2% of Actual Reading
Maximum Operating Pressure	400 PSI
Output Signal	0 – 15 V Peak Pulse

Flow meter shall be equal to Onicon Series F-1299-STANLS Dual Turbine with stainless steel wetted parts. Provide with optional install kit for steel pipe along with D-1201 GPM display module

2.5 VARIABLE FREQUENCY DRIVES

A. Summary

1. Work Includes: furnish variable frequency drives (constant and variable torque) for NEMA T-Frame motors as shown on the Drawings:

   a. up to 250 HP
   b. 208, 240 and 480 Volt
   c. 3-phase
   d. 60 Hz

2. Variable frequency drives shall be of sufficient capacity and provide quality output waveform to achieve full rated output of the motors.

3. The Owner reserves the right to award a single complete order, or award separate orders for the Variable Frequency Drive Controller(s).

B. Submittals

1. Completed Material Data Sheets for variable frequency drive controllers and other options (see attached data sheet)

2. Nominal dimensions

3. Weight

4. Typical efficiency vs. speed graphs for variable torque load

5. The amount of harmonic distortion contributed to the motor and the electrical system

6. Available NEMA enclosure types

7. List of spare parts containing part numbers, description and price of each

8. Outline of the extent of the training that is available for the maintenance electricians. This training will include training to the level of replacing printed circuit boards to drive testing and calibration. This outline shall include the cost to Abbott either per person or per session.

9. All options being provided.

C. Codes and Standards

1. Variable frequency drives shall be designed, tested and assembled in accordance with the latest applicable standards of:

a. IEC International Electrical Code

b. IEEE Institute of Electrical and Electronics Engineers

c. NEMA National Electrical Manufacturers Association

d. UL Underwriters Laboratories, Inc.

D. Manufacturers

1. All VFD's for this project shall be as manufactured by Allen–Bradley\Rockwell Automation, ABB or Toshiba.

E. Enclosures

1. The unit must be capable of being mounted in a NEMA 2 vented enclosure.

2. The drive shall have power terminal blocks physically separate from the control signal terminal blocks.

3. Bypass VFD and all accessories shall be housed in a single manufacturer provided, stand alone enclosure.

F. Drive Environment

1. The ambient temperature range is 35° F to 100° F.

2. Unit shall operate satisfactorily at 3,300 feet above sea level without derating.

3. Unit shall operate satisfactorily in a range of 5 to 95 percent humidity.

G. Input Power

1. Variations of up to plus or minus 10 percent of the rated input voltage will be permitted without the drive shutting down on a fault.

2. Variations of up to plus or minus 2 Hz of the line frequency will be permitted without the drive shutting down on a fault.

3. Power line interruptions of up to 0.5 second or greater will be permitted without the drive shutting down on a fault.

4. The drive shall present a displacement power factor of 0.98 or better to the AC line at any speed or load.

5. The drive shall not require an input isolation transformer. Input impedance at the drive shall be no less than 3.0%.

6. The drive control efficiency at rated load and frequency shall be 97% or better.

7. The drive input circuitry shall not generate line notches or large voltage transients on the incoming line.

H. Output Power

1. The drive shall produce a three phase output for the load.

2. The output frequency of the drive shall be adjustable from 0 to 120 Hz in 0.01 Hz increments.

3. The drive shall have the ability to supply 180% of the rated starting torque of the motor.

4. The drive shall be capable of maintaining 100% of rated output current continuously when operating within the specified range of ambient conditions.

5. The drive shall be capable of delivering 115% of the motor rated current for up to one minute when operating within the specified range of ambient conditions.

6. The drive shall allow for the setting of the voltage to frequency relationship in the region below the Field Weakening Point.

7. The drive shall have a programmable pulse-width-modulated (PWM) carrier frequency.

8. The drive shall be capable of operating open circuited with no fault or damage.

9. The drive shall produce the rated voltage at 60 Hz and shall stay constant at that rated voltage for output frequencies greater than 60 Hz.

10. The drive output waveform shall be the PWM type waveform producing smooth torque at low frequencies and producing low amplitude harmonics.

11. The total harmonic voltage distortion shall be limited to 5%. Harmonic trap filters shall be furnished as required to control harmonic distortion to the required limits. Provide harmonic calculations and include in submittal for approval.

I. Control Features

1. The drive shall produce an output frequency proportional to the speed reference without external feedback.

2. The drive shall maintain set frequency and not require readjustment due to changes in load.

3. The drive shall have two independently adjustable acceleration and deceleration rates.

4. The drive shall have a current limiting circuit that decreases the acceleration rate of the motor should the load inertia causes excessive currents.

5. The drive shall have a selectable deceleration voltage limiting circuit which will extend the deceleration ramp should the bus voltage approach high limits due to regeneration.

6. The drive shall have the option to block out five frequency ranges to minimize problems due to mechanical resonance in the driven equipment.

7. The drive shall have a incrementally adjustable IR compensation boost to produce higher voltages at low speeds.

8. The drive shall contain two analog inputs as standard which are both capable of operating from 0-10 VDC or 0-20 mA or a potentiometer.

9. The drive shall produce analog output signals of 0 to 20 mA which can be proportional to output frequency, motor speed, output current, output voltage, motor torque, motor power, DC Bus voltage and motor voltage.

10. The drive shall have the option to be programmed with DC Injection Breaking as part of the program stop function.

11. The drive shall have an RS-485 port.

12. The drive shall be able to communicate with the existing Siemens Controls system. Provide internal interface card.

13. The customer interface shall include a 40 character digital display with keypad.

14. Dedicated terminal blocks for hard wire Start/Stop, Fire, Freeze and Start interfaces by customer. All external interlocks and Start/Stop contacts shall function in Hand, Auto, or Bypass mode.

J. Motor Protection

1. Motor protection shall conform to UL recognized M.O.L. (508C).

K. Phase Protection

1. The drive shall have protection against a phase-to-phase short in the output load, or a short circuit in a phase of the output module.

L. Drive Protection

1. The drive shall have:

a. Over current protection (375% instantaneous) with automatic restart.

b. Short circuit protection (phase to phase).

c. DC bus under voltage protection (65%).

d. DC bus over voltage protection (130%).

e. Over temperature protection.

f. Power semiconductor protection.

g. Ground Fault protection.

M. Options

1. 5% Line Reactors

2. Soft Start Manual Bypass

3. Pre-wired Hand-Off- Auto Switch

N. Service

1. Startup service performed by a factory approved and certified technician.

2. To be included with the startup serice, for a period of two years after initial startup, is a full parts and labor onsite warranty at no additional costs.

3. The service center must be permanently located within (100) miles of the job site.

O. Field tests and Checks

1. Testing, checkout and startup of the VFD equipment shall be performed under the technical direction of the manufacturer's service engineer. Under no circumstances are any portion of the drive system to be energized without authorization from the manufacturer's representative.

2. The VFD manufacturer shall provide to the owner a startup service for all VFD's provided. The service shall include inspection, final report for record purposes.

3. A copy of all tests and checks performed in the field, complete with meter readings and recordings, where applicable, shall be submitted to the owner for this record.

2.5 REFRIGERANT GAS MONITOR

2.5.1 General - The gas monitoring system shall continuously measure and display the specified gas concentration with a minimum detection limit of 1 ppm and meet ANSI/ASHRAE 15-2016 and ANSI/ASHRAE 147-2016 standards. The system shall provide visual indicators when preset limits are exceeded. Relay output for alarms and control shall be provided.

2.5.2 Types of Monitoring Points – monitor shall have ability to detect up to 6 different refrigerants at once.

2.5.3 User shall have ability to field-select multiple refrigerants from refrigerant library through touchscreen display.

2.5.3 System Configuration

A. Description - The system shall consist of a sample draw with multi-point sampling and multi-refrigerant capability and monitor/readout unit.

B. Monitor/Readout Configuration - The unit shall be a wall mount type with IP54 enclosure. to include a touchscreen display should provide access to all monitor functions including display, calibration, set-up and diagnostics. The display shall also provide alarm acknowledgment and audible alarm silencing.

C. Operating Principle - The principle of operation shall be of the photo-acoustic infrared (PIR) absorption type.

1. Analyzer Sample - The analyzer shall be of the sample draw type with an internal pump and filter.

2. Analyzer Sensitivity - The analyzer shall be capable of monitoring over a range of 0-1000 ppm with a sensitivity of 1 ppm in the 0-50 ppm range and ±10% of reading in the 51-1000 ppm range.

3. Analyzer Linearity - The analyzer shall be capable of maintaining a linear response in the range of 0-100 ppm and ± 2% of full scale in the range of 100-1000 ppm.

4. Temperature - The system shall operate over the range of 0^{O} to 50^{O} C.

5. Stability - The 30 day zero or span drift must be less than 1% F.S. without the aid of automatic or manual re-calibration. The system must not employ any type of auto zero techniques in order to maintain analyzer stability. Use of fresh air source or scrubber as a zero reference is not permitted.

2.5.4 Calibration - The system must provide a menu-driven method of checking both zero and span calibration.

2.5.5 Monitor Unit Requirements

A. Visual Alarm Indicators - All alarm indications shall be displayed on the front panel display.

B. Alarm Set Point Levels - Three separate alarm set point levels shall be provided. The set points shall be independently adjustable for any value for a given range. The set points shall provide drive signals to user interface relays. The alarm set points shall have the capability of providing the user a selection of latching or non-latching.

C. Relay Outputs - The alarm set point drive signals shall activate user relays as specified in Paragraphs 2.5.3.A through 2.5.3.C

1. Number of Relays - As a minimum, one relay for each alarm set point level shall be provided.

2. Contact Rating - All relays shall be Form C, single pole, double throw. Dry contacts shall be rated for 8 amps resistive at 250 VAC.

3. Contact Selection - The contacts shall be capable of being selected normally energized or non-energized, latching or non-latching.

D. Malfunction Indication - The readout display described in Paragraph 2.5.3 shall display full diagnostics when a fault exists without the use of codes.

E. Audible Alarm - An audible buzzer is included, it sounds when one of the three preselected alarm conditions or a trouble condition occurs. System shall provide optional external horn relay for audible signaling.

F. Front Panel Controls - The function listed in this paragraph shall be accomplished using a touchscreen interface readily accessible on the front panel. No tool or special adapters shall be used for: (a) display of alarm set point level on the readout display, (b) resetting any alarm set point, (c) zero and span calibration adjustments

G. Sample Gas Filter - There shall be an internal sample gas filter. This filter shall be easily serviced or replaced. System shall notify user of replacement.

H. Output Signals - The system shall be capable of supplying a 4-20 mA, 0-10V, native BACnet or Modbus signal representing the gas concentration being sampled.

2.5.6 System Power Requirements - The system shall operate on 115 or 220 VAC. Power input not to exceed 60 watts in single channel of operation.

2.5.7 Multi Point Capability - The system shall be expandable to include a Multi Point Sequencer with up to four (4) eight (8) or (16) sampling points.

A. System must be capable of allowing the user, through the front panel keypad, to determine which of the four (4) eight (8) or (16) points are to be active in the sequencer.

B. The sequencer shall be mounted integral to the analyzer.

2.5.8 Sequencer Programming Limits - The sequencer system parameters shall be within the following limits: 1000 part per million in one part per million increments.

A. Sample Tubing Connection - Fittings suitable for the connection of 1/4" O.D. tubing shall be provided on the bottom of the enclosure for the purposes of connection, sample lines, calibration gases and exhaust.

B. Alarm - Three alarm set point levels shall be provided for each sample location. Any alarm set point shall be capable of activating one relay (SPDT, 8 amp at 250 VAC, resistive).

C. Indicating Lights - All indications related to the Multi Point Sequencer shall appear through the user interface

2.5.9 Sample Handling - The sample handling system shall conform to Paragraphs A through D.

A. Sample Line Compatibility - The system shall be capable of drawing a sample through 1/8" I.D. tubing for a distance of 150 feet.

B. Sequencer Operation - A sample shall be drawn from the next line in sequence regardless of which location is being analyzed.

C. Sample Conditioning - The system shall provide adequate filtration of the sample suitable to protect the analyzer.

D. Exhaust - Exhaust fitting shall be provided on the bottom of the enclosure for the purpose of attaching exhaust lines to the sample and bypass flows.

2.5.10 Maximum System Maintenance Requirements - The system shall require no periodic maintenance other than periodic checking. The system shall offer a self-check feature on the pump module, sensor module and flow system. Periodic checking or adjustments of the unit shall be capable of being accomplished by one person at the unit location.

2.5.11 The system shall notify user of maintenance requirements from the sensor module, pump module and flow system through the touchscreen display interface.

2.5.12 Manufacturer Capability Requirements - As a minimum, the Gas Monitoring Equipment manufacturer must meet the following requirements: (a) be capable of supplying all equipment used to check or calibrate the unit, (b) be capable of providing on site service with factory trained personnel, (c) be capable of providing start-up assistance and training for the owner/operator

3.0 EXECUTION

3.1 SEQUENCE OF OPERATIONS

A. Refer to contract documents for all control sequences and diagrams.

3.2 ADDITIONAL FIELD SERVICES

A. Provide services of control supplier's field engineer to supervise work specified in other Sections:

1. Provision of auxiliary contacts on magnetic starters with buttons and switches in required configurations.

3.3 EXAMINATION

A. The project plans shall be thoroughly examined for control device and equipment locations, and any discrepancies, conflicts, or omissions shall be reported to the Owner for resolution before rough-in work is started.

B. The Subcontractor shall inspect the site to verify that equipment is installable as shown, and any discrepancies, conflicts, or omissions shall be reported to the Owner for resolution before rough-in work is started.

3.4 SUBCONTRACTOR RESPONSIBILITIES

A. Installation of the building automation system shall be performed by the subcontractor or a sub-subcontractor. However, all installation shall be under the personal supervision of the Subcontractor. The Subcontractor shall certify all work as proper and complete. Under no circumstances shall the design, scheduling, coordination, programming, training, and warranty requirements for the project be delegated to a sub-subcontractor.

B. Cleanup

1. At the completion of the work, all equipment pertinent to this contract shall be checked and thoroughly cleaned, and all other areas shall be cleaned around equipment provided under this contract. Clean the exposed surfaces of tubing, hangers, and other exposed metal of grease, plaster, or other foreign materials. All work on the roof shall be done such that the roof membrane is protected at all times.

3.5 GENERAL WORKMANSHIP

A. Install equipment, piping, wiring/conduit parallel to building lines (i.e. horizontal, vertical, and parallel to walls) wherever possible.

B. Provide sufficient slack and flexible connections to allow for vibration of piping and equipment.

C. Install all equipment in readily accessible location as defined by Chapter 1 Article 100 part A of the NEC. Control panels shall be attached to structural walls unless mounted in equipment enclosure specifically designed for that purpose. Panels shall be mounted to allow for unobstructed access for service.

D. Verify integrity of all wiring to ensure continuity and freedom from shorts and grounds.

E. All equipment, installation, and wiring shall comply with acceptable industry specifications and standards for performance, reliability, and compatibility and be executed in strict adherence to local codes and standard practices.

3.6 WIRING

A. All control and interlock wiring shall comply with the national and local electrical codes and electrical drawings. Where the requirements of this section differ with those on the electrical drawings, the requirements of this section shall take precedence.

B. All control wiring shall be run in conduit; Minimum 18 Gauge at end device panel.

C. Conduit:

1. No conduit for any part of the ATC system shall be smaller than ½" in size. No conduit shall have more than (4) 90 deg. Bends in any One run, and where necessary, pull boxes shall be provided.

2. Thin wall conduit (EMT), zinc-coated steel, conforming to industry standards, equal to Pittsburgh Conduit Co., Republic Steel and Tube, or Youngstown sheet and tube.

3. Flexible Steel conduit shall be used for connection to all ATC equipment/devices and motors. All flexible connections shall include a grounding conductor from the outlet box to the equipment being connected. Flexible steel conduit exposed to the weather shall be liquid tight.

D. All wire-to-device connections shall be made at a terminal blocks or terminal strip. All wire-to-wire connections shall be at a terminal block, or with a crimped connector. All wiring within enclosures shall be neatly bundled and anchored to permit access and prevent restriction to devices and terminals.

E. Maximum allowable voltage for control wiring shall be 120V. If only higher voltages are available, the Control System Contractor shall provide step down transformers.

F. All wiring shall be installed as continuous lengths, where possible. Any required splices shall be made only within an approved junction box or other approved protective device.

G. Size of conduit and size and type of wire shall be the design responsibility of the Control System Contractor, in keeping with the manufacturer's recommendation and NEC.

H. Control and status relays are to be located in designated enclosures only. These relays may also be located within packaged equipment control panel enclosures. These relays shall not be located within Class 1 starter enclosures.

I. Follow manufacturer's installation recommendations for all communication and network cabling. Network or communication cabling shall be run separately from other wiring.

J. This Contractor shall terminate all control and/or interlock wiring and shall maintain updated (as-built) wiring diagrams with terminations identified at the job site.

K. Flexible metal conduits and liquid-tight, flexible metal conduits shall not exceed 3' in length and shall be supported at each end. Flexible metal conduit less than 1/2" electrical trade size shall not be used. In areas exposed to moisture, including chiller and boiler rooms, liquid-tight, flexible metal conduits shall be used.

L. Wires shall be marked and the terminals shall be tagged with the respective instrument number. All communication cables at NCU and workstation to be tagged.

M. Coordination Issues

1. When motors are manually or automatically controlled from the HVAC ATC panels, the panels shall include a set of normally dry (non-powered) contacts (for connection to the motor starter) which close when the motor is to operate. The ATC contractor will wire these contacts to the motor starter and make connections to the terminals provided. Contacts shall be rated 120 volts, 10 amperes, 60 Hertz for inductive and resistive loads.

2. A set of normally open dry (non-powered) contacts (for connection to the HVAC ATC panel) which close when the motor starter has pulled in, shall be provided under Section 16000.

3. The ATC contractor will make connections to the terminals provided and wire these contacts from the motor starter to the HVAC ATC panel to signal the motor is operating.

3.7 HARDWARE INSTALLATION

A. All controllers are to be mounted vertically and per the manufacturer’s installation documentation.

B. The 120 VAC power wiring to each controller shall be a dedicated run, with a separate breaker. Each run will include a separate hot, neutral, and ground wire. The ground wire will terminate at the breaker panel ground. This circuit will not feed any other circuit or device.

C. Wires are to be attached to the building proper at regular intervals such that wiring does not droop. Wires are not to be affixed to or supported by pipes, conduits, etc.

D. Conduit in finished areas will be concealed in the ceiling cavity spaces, plenums, furred spaces, and wall construction. Exception; metallic surface raceway may be used in finished areas on masonry walls. All surface raceway in finished areas must be color matched to the existing finish within the limitations of standard manufactured colors.

E. Conduit in non-finished areas where possible will be concealed in ceiling cavity spaces, plenums, furred spaces, and wall construction. Exposed conduit will run parallel to or at right angles to the building structure.

F. Wires are to be kept a minimum of 3” from hot water, steam, or condensate piping.

G. Where sensor wires leave the conduit system, they are to be protected by a plastic insert.

H. Installation Practices for Field Devices

1. Well-mounted sensors will include thermal conducting compound within the well to insure good heat transfer to the sensor.

2. Actuators will be firmly mounted to give positive movement and linkage will be adjusted to give smooth continuous movement throughout 100 percent of the stroke.

3. Relay outputs will include transient suppression across all coils. Suppression devices shall limit transients to 150% of the rated coil voltage.

4. Water line mounted sensors shall be removable without shutting down the system in which they are installed.

5. Flow measurement devices shall be installed with a minimum of five pipe diameters upstream and downstream for accurate flow measurement. All measurement devices shall be installed as per manufacturer's recommendations.

6. For duct static pressure sensors, the high pressure port shall be connected to a metal static pressure probe inserted into the duct pointing upstream. The low pressure port shall be left open to the plenum area at the point that the high pressure port is tapped into the ductwork.

7. For building static pressure sensors, the high pressure port shall be inserted into the space via a metal tube. Pipe low pressure port to adjacent office spaces.

I. Location

1. The locations of sensors are as indicated on the plans and approved by the Engineer.

2. Space humidity or temperature sensors will be mounted away from machinery generating heat, direct light and diffuser air streams.

3. Outdoor air sensors will be mounted on the north building face directly in the outside air. Install these sensors such that the effects of heat radiated from the building or sunlight is minimized.

4. Field enclosures shall be located immediately adjacent to the controller panel(s) to which it is being interfaced.

3.8 ACTUATORS

A. Mount and link control damper actuators per manufacturer's instructions.

B. To compress seals when spring return actuators are used on normally closed dampers, power actuator to approximately 5° open position, manually close the damper, and then tighten the linkage.

C. Check operation of damper/actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.

3.9 IDENTIFICATION OF HARDWARE AND WIRING

A. All wiring and cabling, including that within factory-fabricated panels, shall be labeled at each end within 2" of termination with a cable identifier and other descriptive information.

B. Permanently label or code each point of field terminal strips to show the instrument or item served.

C. Identify control panels with minimum 1 cm letters on laminated plastic nameplates.

D. Identify all other control components with permanent labels. Identifiers shall match record documents. All plug-in components shall be labeled such that removal of the component does not remove the label.

3.10 PROGRAMMING

A. Provide sufficient internal memory for the specified control sequences and trend logging. There shall be a minimum of 25% of available memory free for future use.

B. Point Naming: System point names shall be modular in design, allowing easy operator interface without the use of a written point index.

C. Control Panels Programming

1. Provide programming for the system as per specifications and adhere to the strategy algorithms provided. All other system programming necessary for the operation of the system but not specified in this document shall also be provided by the Control System Contractor. Embed into the control program sufficient comment statements to clearly describe each section of the program. The comment statements shall reflect the language used in the sequence of operations.

D. Demonstration: A complete demonstration and readout of the capabilities of the monitoring and control system shall be performed. The contractor shall dedicate a minimum of 16 hours on-site with the Owner and his representatives for a complete functional demonstration of all the system requirements. This demonstration constitutes a joint acceptance inspection, and permits acceptance of the delivered system for on-line operation.

3.11 CLEANING

A. This Subcontractor shall clean up all debris resulting from his or her activities daily. The Subcontractor shall remove all cartons, containers, crates, etc. under his control as soon as their contents have been removed. Waste shall be collected and placed in a location designated by the Owner.

B. At the completion of work in any area, the Subcontractor shall clean all of his/her work, equipment, etc., making it free from dust, dirt and debris, etc.

C. At the completion of work, all equipment furnished under this Section shall be checked for paint damage, and any factory finished paint that has been damaged shall be repaired to match the adjacent areas. Any metal cabinet or enclosure that has been deformed shall be replaced with new material and repainted to match the adjacent areas.

3.12 PROTECTION

A. The Subcontractor shall protect all work and material from damage by his/her work or workers, and shall be liable for all damage thus caused.

B. The Contractor shall be responsible for his/her work and equipment until finally inspected, tested, and accepted. The Contractor shall protect his/her work against theft or damage, and shall carefully store material and equipment received on site that is not immediately installed. The Contractor shall close all open ends of work with temporary covers or plugs during storage and construction to prevent entry of foreign objects.

3.13 TRAINING

A. Provide a minimum of 24 hours total of owner training, throughout the contract period for personnel designated by the Owner.

3.14 VFD INSTALLATION, ADJUSTING & DEMONSTRATING

A. All work, materials and equipment shall comply with the rules and regulations of applicable local, province, and federal codes and ordinances as identified in Part 1 of this Section.

B. Contractor shall continually monitor the field installation for code compliance and quality of workmanship. All visible piping and or wiring runs shall be installed parallel to building lines and properly supported.

C. Contractor shall arrange for field inspections by local and/or state authorities having jurisdiction over the work.

D. Prepare for acceptance tests as follows:

1. Test insulation resistance for each enclosed controller element, bus, component, connecting supply, feeder, and control circuit.

2. Test continuity of each circuit.

E. Manufacturer's Field Service: Engage a factory authorized service representative to perform the following:

1. Inspect controllers, wiring, components, connections, and equipment installation.

2. Assist in field testing of equipment including pretesting and adjusting of solid-state controllers.

3. Report results in writing.

F. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports:

1. Perform each electrical test and visual and mechanical inspection, except optional tests, stated in NETA ATS. Certify compliance with test parameters.

2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

G. Set field adjustable switches and circuit breaker trip ranges.

H. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain variable frequency controllers. A minimum of one (1) eight hour training session shall be provided.

3.15 VENDOR SYSTEM TESTING

A. Testing

1. Assemblies and subassemblies shall be factory tested in accordance with BMS subcontractor standard quality assurance program. This testing shall be done prior to site acceptance tests.

B. Site Acceptance Test

1. After the system is delivered and installed at the site, the system shall go through site acceptance test (SAT).

2. Site Acceptance Test (SAT): Following installation of the BMS system, all hardware shall be aligned and adjusted, and all test readings recorded in accordance with the BMS subcontractors recommended tests and maintenance procedures. The BMS subcontractor shall include, in the associated test report, a list of all hardware components replaced or changed between the tests. All hardware shall be demonstrated to be operational by running the off-line diagnostics. The SAT test shall be considered complete only after all variances generated during installation are resolved and tested. The BMS Contractor shall utilize their standard SAT procedures.

a. All application software will be verified and compared against the sequence of operation. Control loops will be exercised by inducing a set point shift of at least 10% and observing whether the system successfully returns the process variable to setpoint. Record all test results and attach to the test results sheet.

b. Test each alarm in the system and validate that the system generates the appropriate alarm message, that the message appears at all prescribed destinations (workstations or printers), and that any other related actions occur as defined (i.e. graphic panels are invoked, reports are generated, etc.). Submit a test Results sheet to the owner.

3. Operational Acceptance Test: The BMS Contractor shall utilize their standard operational test procedures. After all previous testing has been successfully completed; operate the BMS, for fourteen (14) days. Any failure between field-sensing equipment and the control panels (included FEP’s) shall be corrected, and the testing shall continue from the day of failure.

a. Perform an operational test of each unique graphic display and report to verify that the item exists, that the appearance, and content are correct, and that any special features work as intended. Submit a Test Results Sheet to the Owner.

b. Perform an operational test of each third party interface that has been included as part of the automation system. Verify that all points are properly polled, that all alarms have been configured, and that any associated graphics and reports have been completed. If the interface

involves a file transfer over Ethernet, test any logic that controls the transmission of the file, and verify the content of the specified information.

4. Final Acceptance: The BMS will not be considered accepted by the Owner until all of the foregoing tests are successfully completed. Beneficial use of the system by Owner will not be considered as acceptance.

5. Final Acceptance Criteria: Owner will deem the BMS to be fully accepted when:

   a. All structured, unstructured and availability tests have been successfully completed, and all incidents and variances have been resolved.

   b. All instrument calibration is current and is acceptable to Arden and the Owners Representative.

   c. All documentation and training requirements have been completed and are satisfactory to the owner.

   d. All identified defects have been corrected to the Owner's satisfaction.

   e. Owner has received all required software licenses.

   f. Operational check verification forms (each control loop).

   g. Operation checks completion report (each system).

   h. Graphic trend printout of all points indicated on the contract documents proving that the system is operating per the design intent for both the winter and summer seasons.

C. Point to Point Checkout.

1. Each I/O device (both field mounted as well as those located in FIPs) shall be inspected and verified for proper installation and functionality. A checkout sheet itemizing each device shall be filled out, dated and approved by Arden for submission to the Owner or Owners Representative.

D. Test and Calibration Procedures

1. Procedures to be generated by BMS Contractor utilizing their standard test procedures. All executed documents to be provided to owner upon completion.

2. Control Panel Field Check

   a. Verify power wiring, record breaker panel information, check for correct voltages (primary and secondary). Visually check panel for damaged or loose components.

3. Controller Procedure

   a. Check installation

b. Power-up controller

c. Enable battery backup

d. Write controller serial number on respective checkout sheet or affix serial number sticker to sheet and mark number on building plans at VAV, FCU etc. locations (by electrical sub-contractor)

4. Device Calibration

a. Electric Actuators: Check and adjust all linkage and setup petitioners to require ranges. All valves and dampers shall be stroked through their ranges by disabling and manipulating outputs from the computer terminal while viewing end device. Modulating devices shall be tested at beginning, midpoint and end range.

b. Equipment start/stop. (Digital Output):

- Ensure that proper equipment relays actuate via local override switches.

c. Equipment status/ current switches, auxiliary contacts. (Digital Inputs):

- Ensure that correct input status is received upon operation of equipment.

d. Equipment Status/current transformers (Analog Input):

- Ensure amperage draw readings are accurate. Compare reading with Amp meter.

3.16 SENSOR CALIBRATION

A. The purpose of calibrating instruments prior to the start-up of a plant is to check the operability and calibration of the instruments by the simulation of operating conditions. After calibration, instruments shall be handled as little as possible.

B. The Contractor shall provide 3-point calibration factory records for all calibrated instruments for qualified instrumentation.

C. The Contractor shall perform signal transmission checks for all input points and corrective action to be performed to any analog sensor that falls outside the expected value at the zero and span adjustments for all analog sensors. All analog sensors shall receive single point verification with a certified instrument after installation. The single point verification shall be taken at midpoint of normal operating range. A 3-point calibration shall specify accuracy.

D. The Contractor shall provide all factory and field Instrument Calibration Records performed and instrument Test Records filled out signed and submitted to the Owner for distribution and permanent records.

E. The Contractor shall review Owner’s calibration policy and notify Owner of any deviations from these requirements.

3.17 TEST INSTRUMENT AND CALIBRATION DOCUMENTATION

A. Test Instruments:

1. All calibration and test equipment used shall be traceable to the National Institute of Standards and Technology. Reference equipment used shall be a minimum of 4 times more accurate than the instruments being calibrated. Exception: 2 times for humidity.

B. Documentation:

1. The manufacturer shall provide current calibration certificates of all reference and test instruments used to perform field-testing prior to start of work.

2. All testing shall be documented by the manufacturer's technician.

3. Provide contractors loop checkout report and calibration forms for Owner's approval.

3.18 TESTING, INSPECTION, AND COMMISSIONING CRITERIA

A. All materials, hardware, software/firmware, and documentation to be furnished under this specification shall be subject to observation and tests. Equipment shall not be accepted until all required observations, tests and third party commissioning has been made, demonstrating that the equipment conforms to the specification, and the hardware, software/firmware, and documentation, have been provided. Approval of inspections and test results, acceptance of hardware, software/firmware, and documentation or the waiving of observations and tests thereof shall in no way relieve the BMS subcontractor of the responsibility of providing equipment, software/firmware, and documentation which meets the requirements of this specification.

B. The ATC Subcontractor shall provide time to assist the commissioning agent as needed along with demonstrating and providing all documentation required by the commission agent. Refer to Specification "HVAC Commissioning" for additional details.

3.19 ACCEPTANCE

A. The control systems will not be accepted as meeting the requirements of Completion until all tests described in this specification have been performed to the satisfaction of both the engineer and Owner. Any tests that cannot be performed due to circumstances beyond the control of the Subcontractor may be exempt from the Completion requirements if stated as such in writing by the Owner's representative. Such tests shall then be performed as part of the warranty.

B. Each point in the system shall be tested for both hardware and software functionality. In addition, each mechanical and electrical system under control of the BMS will be tested against the appropriate sequence of operation specified herein. Successful completion of the system test shall constitute the beginning of the warranty period. A written report will be submitted to the Owner indicating that the installed system functions in accordance with the plans and specifications.

C. The BMS subcontractor shall commission and set in operating condition all major equipment and systems, such as the computer room units and exhaust fans, in the presence of the equipment manufacturer's representatives, as applicable, and the Owner.

+ + END OF SECTION 239500 + +

TABLE OF CONTENTS

1.0 GENERAL

1.1 SCOPE OF WORK

A. The work covered by this Section consists of all labor and materials to fully adjust and balance air and water systems as shown on the attached drawings and as described in this Specification.

B. This subcontractor shall coordinate and work closely with the ATC subcontractor, sheet metal subcontractor, piping subcontractor and Engineer to achieve required air and water balance.

C. This contractor shall become familiar with all HVAC systems that are a part of this work.

D. This contractor shall provide all instrumentation, fully calibrated, to undertake measurements as outlined in this specification.

E. This contractor shall provide an air and water balancing report for each phase of work as described in this specification.

F. The following systems shall be balanced:

1. Chilled Water System – New chiller pumps and chiller only.

2. Condenser Water System – New Condenser Water Pumps, Tower and Chillers

3. Measure chilled water DP and coordinate input with BMS Contractor.

4. Existing inline exhaust fan for refrigerant purge system

G. Field support & paperwork & paperwork as needed to support the project commissioning.

H. Balancer to include time spent in the field with the Engineer of Record as needed to prove readings indicated in report.

1.2 WORK NOT INCLUDED

A. Specifications for materials and installation of adjusting and balancing devices. If devices must be added to achieve proper adjusting and balancing, bring to the attention of the Mechanical Contractor for materials and installation requirements.

B. Requirements and procedures for piping and ductwork systems leakage tests.

1.3 DEFINITIONS

A. Systems testing, adjusting and balancing is the process of checking and adjusting airflow and fluid flow to produce the design objectives. It includes:

1. Adjustment of total system to provide design quantities.

2. Verification of performance of all equipment and automatic controls.

B. Test: To determine quantitative performance of equipment.

C. Adjust: To regulate the specified fluid flow rate at the equipment (e.g., throttling).

D. Balance: To proportion flows within the distribution system (submains and branches) according to specified design quantities.

E. Procedure: Standardized approach and execution of sequence of work operations to yield reproducible results.

F. Report Forms: Test data sheets arranged for collecting test data in logical order for submission and review. These data should also form the permanent record to be used as the basis for future required testing, adjusting, and balancing.

G. Main: Pipe or Duct containing the system's major or entire fluid flow.

H. Submain: Pipe or Duct containing part of the systems' capacity and serving two or more branch mains.

I. Branch: Pipe or Duct serving a single point of use.

1.4 SUBMITTALS

A. Procedures and Agenda:

1. Submit a synopsis of the adjusting and balancing procedures and agenda proposed to be used for this project.

B. Certified Reports:

1. Submit adjusting and balancing reports bearing the seal and signature of the Test and Balance Engineer. The reports shall be certified proof that the systems have been adjusted and balanced in accordance with the referenced standards; are an accurate representation of how the systems have been installed; are a true representation of how the systems are operating at the completion of the adjusting and balancing procedures; and are an accurate record of all final quantities measured, to establish normal operating values of the systems. Follow the procedures and format specified below:

a. Final Report: Upon verification and approval of draft reports, prepare final reports, typewritten, and organized and formatted as specified below. Submit four (4) complete sets of final reports.

b. Report Format: Report forms shall be those standard forms prepared by the referenced standard for each respective item and system to be adjusted and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with the project identification and a title descriptive of the contents. Divide the contents of the binder into the below listed divisions, separated by divider tabs:

- General Information, Summary and Recommendations

- New Air Cooled Chiller
- Chilled Water Pumps

C. Report Contents: Provide the following minimum information, forms and data:

1. General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses, and contact names and telephone numbers. Also include a certification sheet containing the seal and name, address, telephone number, and signature of the Certified Test and Balance Engineer. Include in this division a listing of the instrumentations used for the procedures along with the proof of calibration.

2. The remainder of the report shall contain the appropriate forms containing, as a minimum, the information indicated on the standard report forms prepared by the AABC for each respective item and system. Prepare a schematic diagram for each item of equipment and system to accompany each respective report form.

D. Calibration Reports:

1. Submit proof that all required instrumentation has been calibrated to tolerances specified in the referenced standards, within a period of six months prior to starting the project.

1.5 QUALITY ASSURANCE

A. Agency Qualifications:

1. Employ the services of an independent testing, adjusting, and balancing agency meeting the qualifications specified below, to be the single source of responsibility to test, adjust, and balance the building mechanical systems identified above, to produce the design objectives. Services shall include checking installations for conformity to design, measurement and establishment of the fluid quantities of the mechanical systems as required to meet design specifications, and recording and reporting the results.

2. An independent testing, adjusting and balancing agency certified by Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project, certified by AABC as a Test and Balance Engineer.

3. An independent testing, adjusting and balancing agency certified by National Environmental Balancing Bureau (NEBB) in these testing and balancing disciplines required for this project, certified by NEBB as a Test and Balance Engineer.

B. Codes and Standards:

1. AABC: "National Standards for Total System Balance."

2. ASHRAE: ASHRAE Handbook 2003, HVAC Applications, Chapter 34 Testing, Adjusting, and Balancing.

3. SMACNA: Testing, Balancing and Adjusting of Environmental Systems.

4. NEBB: National Environmental Balancing Bureau.

C. Pre-balancing Conference:

1. Prior to beginning of the testing, adjusting, and balancing procedures, schedule and conduct a conference with the installers of the mechanical systems. The objective of the conference is final coordination and verification of system operation and readiness for testing, adjusting and balancing.

1.6 WARRANTY

A. General Warranty: The national project performance guarantee specified in this Article shall not deprive the Owner of other rights the Owner may have under their provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. National Project Performance Guarantee: Provide a guarantee on AABC's "National Standards" forms stating that AABC will assist in completing the requirements of the Contract Documents if the testing, adjusting and balancing Agent fails to comply with the Contract Documents.

C. Special Guarantee: Provide a guarantee on NEBB forms stating that NEBB will assist in completing the requirements of the Contract Documents if the testing, adjusting and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions.

1. The certified Agent has tested and balanced systems according to the Contract Documents.

2. Systems are balanced to optimum performance capabilities within design and installation limits.

D. The balancing contract cannot be fulfilled until the balancing report is approved by the engineer of record. Any re-balancing work required due to a report being disapproved will be at the expense of the balancing contractor.

E. Any additional field time requested by the Engineer to verify a balancing report reading in the field shall be provided at no additional cost to the owner.

1.7 HVAC EQUIPMENT LIST

A. All proposed new equipment shall be verified with actual approved shop drawings or in the field.

2.0 PRODUCTS

2.1 ACCEPTABLE SUBCONTRACTORS

A. Precision Air Balancing

B. Environmental Testing and Balancing

C. Thomas Young and Associates

3.0 EXECUTION

3.1 EXAMINATION

A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting and balancing of systems and equipment.

1. Contract Documents are defined in the General and Supplementary Conditions of the Contract.

2. Verify that balancing devices, such as manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

B. Examine approved submittal data of HVAC systems and equipment.

C. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting and commissioning specified in individual Specification Sections have been performed.

D. Examine system and equipment test reports.

E. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports and manual volume dampers are properly installed, and their locations are accessible and appropriate for effective balancing and for efficient system and equipment operation.

F. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

G. Examine air system to ensure clean filters have been installed, bearing are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

H. Perform testing and balancing procedures on each system according to the procedures contained in the current edition of the NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems and this section.

3.2 WATER SYSTEMS

A. Preliminary Procedures for Hydronic System Balancing:

1. Before operating the system perform these steps:

a. Open valves to full open position.

b. Remove and clean all strainers.

c. Examine systems and determine if water has been treated and cleaned.

d. Check air vents at high points of systems and determine if all are installed and operating freely.

e. Set temperature controls so all coils are calling for full flow.

f. Check expansion tanks for proper air/water charge.

B. Measurements:

1. Water Systems:

a. Adjust water systems to provide required or design quantities. All terminal devices and equipment shall be balanced to within 10% of design requirements.

b. Use calibrated (Venturi tubes, orifices, or other metered) fittings and pressure gages 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.

c. 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.

d. Effect system balance with automatic control valves fully open to heat transfer elements.

e. 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.

f. Check pressure drops and temperature differentials. Adjust flows to obtain design temperatures and pressure drops.

g. Adjust balancing valves to obtain required flows through coils as shown on the coil hook-up details and schedules.

h. After coil balancing is complete, recheck settings on pumps, chillers and boilers and readjust, if required to obtain proper flow.

C. The test and balancing agency shall prepare a log that will show, but not be limited to, the following design and actual information for all HVAC hot, chilled water and tower water systems. Findings shall be recorded as found in black ink. Errors shall be crossed out, dated, and initialed. Corrections shall be shown immediately adjacent to the error.

1. Pump GPM.

2. Pump suction pressure.

3. Pump discharge pressure.

4. Pump RPM.

5. Pump motor HP.

6. Pump motor voltage and amperage.

7. Pump motor O.L. heater size.

8. Coil GPM.

9. Coil pressure drop.

10. Coil entering and leaving water temperatures.

3.3 AIR SYSTEMS

A. Systems shall be adjusted and balanced so that air quantities and temperatures at outlets are as directed and so that the distribution from supply outlets is free from drafts and uniform over the face of each outlet.

B. Adjustments shall be in such a manner that splitter and volume adjusters close to air outlets will have the least pressure drop consistent with volume requirements.

C. Primary balancing shall be obtained by adjustment of the dampers at branch duct take-offs. Adjustable fan drives shall be used for making final adjustments of total air quantities. Additional dampers or other air volume adjusters required to accomplish the balancing and adjusting shall be furnished and installed as part of the HVAC work.

D. Settings of dampers, splitters, and other volume adjusting devices shall be permanently marked, after completion of balancing and adjusting, so that they can be restored if disturbed at any time. Also, the addition and setting of baffles shall be included where required to get a good mix by the HVAC Subcontractor at the direction of the balancing and adjusting Subcontractor.

E. Direct reading velocity meters may be used for comparative adjustment of individual outlets, but air quantities in ducts having velocities of 1,000 feet per minute or greater, shall be measured by means of traverses.

F. Testing and balancing of systems which contain filters shall simulate the loaded (dirty) filter condition. Testing and balancing contractor shall artificially impose a pressure drop across the filters to accomplish this requirement. All fan speeds, damper settings and documentation shall be based on the dirty filter condition.

G. Requires Tests and Balances – Air Systems: The following tests, balance procedures, and required adjustments shall be performed:

1. Initial Test and Balance:

a. Test and adjust all primary and secondary air quantities on the air handling units, exhaust fans, hoods, etc., to design requirements as shown on the airflow diagrams.

b. Test and record all motor full load amperes.

c. Test and adjust system for design CFM outside air.

d. Test and adjust entering and leaving air temperature, both wet bulb and dry bulb across the coils.

e. Adjust all zones to proper design CFM; supply, return and exhaust.

f. Test and adjust each ceiling diffuser, supply register, return air wall and return/exhaust register to design requirements.

g. Acceptance. Terminal air distribution devices shall be balanced to within 10% of design requirements.

h. Provide duct traverses of all main supply, return and exhaust mains entering and leaving AHU's, exhaust fans and fan coil units. Provide sketches as required to clearly indicate where measurement was taken from

H. After completion of the balancing and adjusting of the air systems, six (6) copies of a report showing the following information shall be submitted to the Engineer for review and approval. The report shall be arranged as follows:

1. Location of each outlet or inlet shown on an up-to-date plan view of each area.

2. Dimensions or size of each outlet or inlet.

3. Type and manufacturer: Diffuser, grille, register, supply, return, exhaust.

4. CFM of air for each outlet or inlet with corresponding velocity.

5. Velocity of air as measured and corresponding cfm at which system has been balanced and adjusted, for each outlet or inlet.

6. Velocity of air measured and corresponding cfm, after each complete system has been balanced and adjusted, for each main branch or zone duct at the supply fan, and the exhaust fan, as the case may be.

7. After each complete system has been balanced and adjusted, the total cfm at fan discharge, static pressure at fan outlet, total static pressure for apparatus, fan speed, motor amperage for each phase and voltage, shall be recorded.

8. Copy of Calibration Certificates for all measuring instruments used.

9. Motors, 1/2-HP and Larger: Test at final balanced conditions and record the following data:

a. Manufacturer, model and serial numbers.

b. Motor horsepower rating.

c. Motor rpm.

d. Efficiency rating of motor.

e. Nameplate and measured voltage, each phase.

f. Nameplate and measured amperage, each phase.

g. Starter thermal-protection-element rating.

3.3 MEASUREMENTS AND INSTRUMENTATION

A. Provide all required instrumentation to obtain proper measurements, calibrated to the tolerances specified in the referenced standards. Instruments shall be properly maintained and protected against damage.

B. Provide instruments meeting the specifications of the referenced standards.

C. Use only those instruments which have the maximum field measuring accuracy and are best suited to the function being measured.

D. Apply instrument as recommended by the manufacturer.

E. Use instruments with minimum scale and maximum subdivisions and with scale ranges proper for the value being measured.

F. When averaging values, take a sufficient quantity of readings which will result in a repeatability error of less than 5 percent. When measuring a single point, repeat readings until two (2) consecutive identical values are obtained.

G. Take all reading with the eye at the level of the indicated value to prevent parallax.

H. Use pulsation dampeners where necessary to eliminate error involved in estimating average of rapidly fluctuation readings.

I. Take measurements in the system where best suited to the task.

3.4 PERFORMING ADJUSTING AND BALANCING

A. Perform adjusting and balancing procedures on each system identified, in accordance with the detailed procedures outlined in the referenced standards.

B. Cut insulation and ductwork for installation of test probes to the minimum extent necessary to allow adequate performance of procedures.

C. Patch insulation, ductwork, and housings, using materials identical to those removed.

D. Seal ducts and test for and repair leaks.

E. Seal insulation to re-establish integrity of the vapor barrier.

F. Mark equipment settings, including damper control positions, fan speed control levers, and similar controls and devices, to show final settings. Mark with paint or other suitable, permanent identification materials.

G. Adjust and balance systems subsequent to significant system modifications, and resubmit test results.

3.5 SYSTEM DEFICIENCIES

A. This Contractor shall advise the Construction Manager/Owner of all system deficiencies in writing. Report missing dampers, controls, etc.

B. Upon completion of system deficiencies, Balancing Contractor shall balance and record data.

+ + END OF SECTION 239900 + +

SECTION 26 05 05 - SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 GENERAL

1.01 SUBMITTALS

A. Sustainable Design Documentation: Submit certification of removal and appropriate disposal of abandoned cables containing lead stabilizers.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 EXECUTION

3.01 PREPARATION

A. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

B. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.

END OF SECTION 26 05 05

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductors for Grounding and Bonding: Also comply with Section 26 05 26.

H. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

I. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
      a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
   3. Color Code:
      a. Equipment Ground, All Systems: Green.

2.02 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:
   1. Feeders and Branch Circuits:
      a. Size 10 AWG and Smaller: Solid.
      b. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
   1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
      a. Size 4 AWG and Larger: Type XHHW-2.

2.03 METAL-CLAD CABLE

A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

B. Conductor Stranding:
   1. Size 10 AWG and Smaller: Solid.
   2. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

E. Grounding: Full-size integral equipment grounding conductor.

F. Armor: Steel, interlocked tape.

2.04 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

2.05 WIRING ACCESSORIES

A. Electrical Tape:
   1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
   2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).

B. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

C. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install metal-clad cable (Type MC) in accordance with NECA 120.

D. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

E. Terminate cables using suitable fittings.

F. Make wiring connections using specified wiring connectors.

G. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

H. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

I. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.

1.02 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.

B. Do not use products for applications other than as permitted by NFPA 70 and product listing.

C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

E. Separately Derived System Grounding:
   1. Separately derived systems include, but are not limited to:
      a. Transformers (except autotransformers such as buck-boost transformers).
   2. Provide grounding electrode conductor to connect derived system grounded conductor to nearest effectively grounded metal building frame. Unless otherwise indicated, make connection at neutral (grounded) bus in source enclosure.
   3. Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the derived system. Make connection at same location as grounding electrode conductor connection.
   4. Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.
   5. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

F. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
   2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
   3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
   4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
   5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
   6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:
         1) Use bare copper conductors where installed underground in direct contact with earth.
         2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Make grounding and bonding connections using specified connectors.
   1. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.

END OF SECTION 26 05 26

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems.

B. Shop Drawings: Include details for fabricated hangers and supports where materials or methods other than those indicated are proposed for substitution.

1.02 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. Comply with applicable building code.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
   2. Conduit Clamps: Bolted type unless otherwise indicated.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   1. Comply with MFMA-4.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.

F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
   2. Concrete: Use preset concrete inserts, expansion anchors, or screw anchors.
   3. Hollow Masonry: Use toggle bolts.
   4. Steel: Use beam clamps, machine bolts, or welded threaded studs.
   5. Preset Concrete Inserts: Continuous metal channel (strut) and spot inserts specifically designed to be cast in concrete ceilings, walls, and floors.
      a. Comply with MFMA-4.
      b. Channel Material: Use galvanized steel.
      c. Manufacturer: Same as manufacturer of metal channel (strut) framing system.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

D. Unless specifically indicated or approved by Architect, do not provide support from roof deck.

E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

F. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

END OF SECTION 26 05 29

SECTION 26 05 33.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.

1.02 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 CONDUIT REQUIREMENTS

A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion.

B. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.02 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.03 FLEXIBLE METAL CONDUIT (FMC)

A. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.

2.04 ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use compression (gland) or set-screw type.
      a. Do not use indenter type connectors and couplings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Conduit Routing:

1. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
2. Arrange conduit to provide no more than 150 feet (46 m) between pull points.
3. Route conduits above water and drain piping where possible.
4. Maintain minimum clearance of 6 inches (150 mm) between conduits and piping for other systems.
5. Maintain minimum clearance of 12 inches (300 mm) between conduits and hot surfaces. This includes, but is not limited to:
   a. Heaters.
   b. Hot water piping.
   c. Flues.

E. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
4. Use conduit clamp to support single conduit from beam clamp or threaded rod.
5. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.

F. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
4. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.

G. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
3. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
4. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
5. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.

H. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

END OF SECTION 26 05 33.13

SECTION 26 05 33.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUBMITTALS

A. Project Record Documents: Record actual locations for outlet and device boxes, pull boxes, cabinets and enclosures, floor boxes, and underground boxes/enclosures.

1.02 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 BOXES

A. General Requirements:
   1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
   2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
   3. Provide products listed, classified, and labeled as suitable for the purpose intended.
   4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
   5. Provide grounding terminals within boxes where equipment grounding conductors terminate.

B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:
   1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
   2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
   3. Use suitable concrete type boxes where flush-mounted in concrete.
   4. Use suitable masonry type boxes where flush-mounted in masonry walls.
   5. Use raised covers suitable for the type of wall construction and device configuration where required.
   6. Use shallow boxes where required by the type of wall construction.
   7. Do not use "through-wall" boxes designed for access from both sides of wall.
   8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
   9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
   1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
   2. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
      a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Box Supports:

1. Secure and support boxes in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.

E. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

END OF SECTION 26 05 33.16

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.

1.02 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Existing Work: Unless specifically excluded, identify existing elements to remain that are not already identified in accordance with specified requirements.

B. Identification for Equipment:
   1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
      a. Transformers:
         1) Identify voltage and phase for primary and secondary.
         2) Identify power source and circuit number. Include location when not within sight of equipment.
         3) Identify load(s) served. Include location when not within sight of equipment.
      b. Enclosed switches, circuit breakers, and motor controllers:
         1) Identify voltage and phase.
         2) Identify power source and circuit number. Include location when not within sight of equipment.
         3) Identify load(s) served. Include location when not within sight of equipment.

C. Identification for Conductors and Cables:
   1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19.
   2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
   1. Materials:

B. Identification Labels:
   1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
   2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

END OF SECTION 26 05 53

SECTION 26 22 00 - LOW-VOLTAGE TRANSFORMERS

PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Include voltage, kVA, impedance, tap configurations, insulation system class and rated temperature rise, efficiency, sound level, enclosure ratings, outline and support point dimensions, weight, required clearances, service condition requirements, and installed features.

B. Shop Drawings: Provide dimensioned plan and elevation views of transformers and adjacent equipment with all required clearances indicated.

1.02 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 TRANSFORMERS - GENERAL REQUIREMENTS

A. Description: Factory-assembled, dry type transformers for 60 Hz operation designed and manufactured in accordance with NEMA ST 20 and listed, classified, and labeled as suitable for the purpose intended.

2.02 GENERAL PURPOSE TRANSFORMERS

A. Description: Self-cooled, two winding transformers listed and labeled as complying with UL 506 or UL 1561; ratings as indicated on the drawings.

B. Insulation System and Allowable Average Winding Temperature Rise:
   1. Less than 15 kVA: Class 180 degrees C insulation system with 115 degrees C average winding temperature rise.
   2. 15 kVA and Larger: Class 220 degrees C insulation system with 150 degrees C average winding temperature rise.

C. Coil Conductors: Continuous aluminum windings with terminations brazed or welded.

D. Winding Taps:
   1. 15 kVA through 300 kVA: Two 2.5 percent full capacity primary taps above and four 2.5 percent full capacity primary taps below rated voltage.

E. Energy Efficiency: Comply with 10 CFR 431, Subpart K.

F. Sound Levels: Standard sound levels complying with NEMA ST 20.

G. Transformer Enclosure: Comply with NEMA ST 20.

PART 3 EXECUTION

3.01 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Install transformers in accordance with NECA 409 and IEEE C57.94.

D. Use flexible conduit, under the provisions of Section 26 05 33.13, 2 feet (600 mm) minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.

E. Arrange equipment to provide minimum clearances as specified on transformer nameplate and in accordance with manufacturer's instructions and NFPA 70.

F. Transformer Support:
   1. Provide required support and attachment in accordance with Section 26 05 29, where not furnished by transformer manufacturer.

G. Provide grounding and bonding in accordance with Section 26 05 26.

END OF SECTION 26 22 00

SECTION 26 28 13 - FUSES

PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Provide manufacturer's standard data sheets including voltage and current ratings, interrupting ratings, time-current curves, and current limitation curves.

PART 2 PRODUCTS

2.01 FUSES

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless specifically indicated to be excluded, provide fuses for all fusible equipment as required for a complete operating system.

C. Provide fuses of the same type, rating, and manufacturer within the same switch.

D. Comply with UL 248-1.

E. Unless otherwise indicated, provide cartridge type fuses complying with NEMA FU 1, Class and ratings as indicated.

F. Voltage Rating: Suitable for circuit voltage.

G. Selectivity: Where the requirement for selectivity is indicated, furnish products as required to achieve selective coordination.

PART 3 EXECUTION

3.01 INSTALLATION

A. Do not install fuses until circuits are ready to be energized.

B. Install fuses with label oriented such that manufacturer, type, and size are easily read.

END OF SECTION 26 28 13

SECTION 26 28 16.13 - ENCLOSED CIRCUIT BREAKERS

PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for circuit breakers, enclosures, and other installed components and accessories.

1.02 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 ENCLOSED CIRCUIT BREAKERS

A. Description: Units consisting of molded case circuit breakers individually mounted in enclosures.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Short Circuit Current Rating:

D. Conductor Terminations: Suitable for use with the conductors to be installed.

E. Provide thermal magnetic circuit breakers unless otherwise indicated.

F. Provide solidly bonded equipment ground bus in each enclosed circuit breaker, with a suitable lug for terminating each equipment grounding conductor.

G. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.

H. Provide externally operable handle with means for locking in the OFF position.

2.02 MOLDED CASE CIRCUIT BREAKERS

A. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.

B. Interrupting Capacity:
   1. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
      a. 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
   2. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.

C. Conductor Terminations:
   1. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

D. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required support and attachment in accordance with Section 26 05 29.

E. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed circuit breakers such that the highest position of the operating handle does not exceed 79 inches (2000 mm) above the floor or working platform.

F. Provide grounding and bonding in accordance with Section 26 05 26.

END OF SECTION 26 28 16.13

SECTION 26 28 16.16 - ENCLOSED SWITCHES

PART 1 GENERAL

1.01 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.

B. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.

1.02 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 ENCLOSED SAFETY SWITCHES

A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Horsepower Rating: Suitable for connected load.

D. Voltage Rating: Suitable for circuit voltage.

E. Short Circuit Current Rating:
   1. Minimum Ratings:
      a. Heavy Duty Single Throw Switches Protected by Class R, Class J, Class L, or Class T Fuses: 200,000 rms symmetrical amperes.

F. Conductor Terminations: Suitable for use with the conductors to be installed.

G. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.

H. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.

I. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

J. Heavy Duty Switches:
   1. Comply with NEMA KS 1.
   2. Conductor Terminations:
      a. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
   3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required support and attachment in accordance with Section 26 05 29.

E. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches (2000 mm) above the floor or working platform.

F. Provide grounding and bonding in accordance with Section 26 05 26.

G. Provide fuses complying with Section 26 28 13 for fusible switches as indicated or as required by equipment manufacturer's recommendations.

END OF SECTION 26 28 16.16

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
RHODE ISLAND JUDICIARY - FACILITIES AND OPERATIONS
250 BENEFIT STREET – ROOM 205
PROVIDENCE, RHODE ISLAND 02903
TEL: 401-222-6700
FAX: 401-222-4740

CRIMINAL BACKGROUND INVESTIGATION AUTHORIZATION, RELEASE AND DISCLAIMER

I, _____, hereby direct and authorize the Bureau of Criminal Identification of the Department of Attorney General for the State of Rhode Island to make available to the Rhode Island Administrative Office of State Courts any criminal record that the Bureau of Criminal Identification has on file in reference to me, and I further consent to the authentication of my identity through fingerprinting, or some other process that may be required to confirm my identity.

I understand that an investigative report may be generated on me from any source that may include information as to my criminal history from any criminal justice agency or court in any or all federal, state, city and county jurisdictions, including any state Department of Motor Vehicle/Drivers' license records, traffic citations and/or registrations.

I hereby waive and release any and all manner of actions, cause of actions, and demands of every kind, nature and description, arising from any release of criminal information and requests therefrom, whatsoever against the State of Rhode Island, the Rhode Island Administrative Office of State Courts, the Bureau of Criminal Identification, the Attorney General, and the employees of the Attorney General's Office, in both law and equity which I may now have or that may arise in the future.

_____ Employee Name (Please Print)	_____ Employee Signature
_____ Maiden Name (If Applicable)	_____ Date
_____ Date of Birth	_____ Employer/Company Name (If applicable)
_____ Place of Birth	_____ Social Security Number

Project Name: _____

Project # _____ Date of Bid/RFP Specifications _____

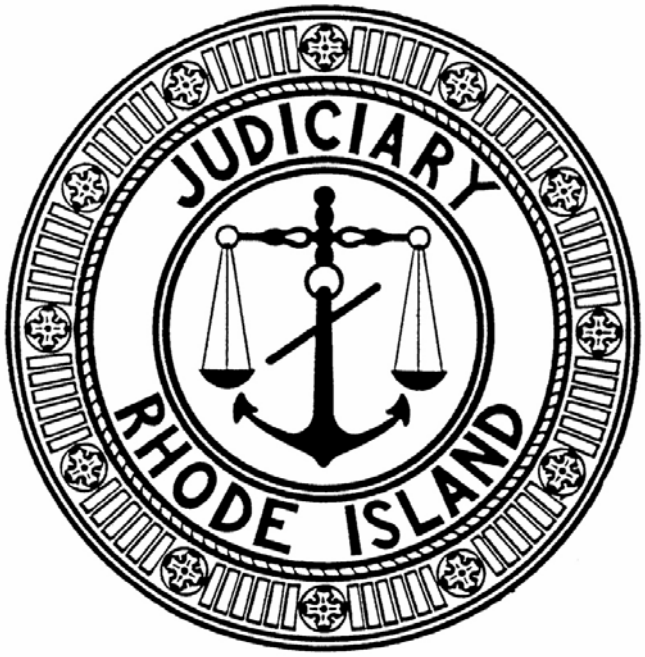
Sworn to before me in the City/Town of _____, State of Rhode Island, this _____ day of _____, 20_____.

_____
Notary Public (Print Name)

Commission expires on _____.

_____
Notary Public (Signature)

Copy of valid photo identification with date of birth must be attached to all BCI Authorization Forms.



JUDICIAL PURCHASING
RULES AND REGULATIONS

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Article I. Authority

With the passage of 2004-2005 Budget Article 45 the Judiciary was given broad power over its administrative affairs. Specifically, the State Court Administrator and the Chief Justice of the Supreme Court now have sole power over judicial procurements and the power to enact the rules and regulations necessary to carry out the procurement power. R.I.G.L. § 8-15-4.

Article 45 had effectively taken judicial purchasing power away from the Department of Administration and vested it in the Court Administrator and the Chief Justice. The following Judicial Purchasing Rules and Regulations contain a fully integrated set of procedures to govern the Judiciary in its exercise of financial control, independent of the Executive Department.

Article II. Purpose and Policy

The following Judicial Purchasing Rules and Regulations are made in compliance with G.L. 1956, 8-15-4(d), whose purpose is to affirm the right of the Judicial Department to be independent of and not subject to financial control exercised by the executive branch of government in matters relating to the operation of the unified state court system.

These rules and regulations take into consideration and conform to, where practicable, existing policies governing financial and purchasing practices within the executive branch of government. Overall, the Judicial Purchasing Rules and Regulations seek to further the policies of State Purchasing as set forth in Title 37, Chapter 2 of the Rhode Island General Laws.

Specifically, the Judicial Purchasing Rules and Regulations aim to:

- simplify, clarify, and modernize the law governing purchasing by the Judiciary;
- permit the continued development of judicial purchasing policies and practices;
- make judicial purchasing laws as consistent as possible with current purchasing laws;
- provide for increased public confidence in the purchasing procedures followed by the Judiciary;
- insure the fair and equitable treatment of all persons who deal with the procurement system of the Judiciary;
- provide increased economy in judicial procurement activities by fostering effective competition; and
- provide safeguards for the maintenance of a judicial procurement system of quality, integrity and highest ethical standards.

Article III. Scope

The procedures established herein do not create any right or benefit, substantive or procedural, enforceable by a party against the Judiciary or the State of Rhode Island or their officers or employees.

Article IV. Participation in Other State Contracts and Use of Services

Whenever practicable, the Judiciary may utilize existing State of Rhode Island Division of Purchases contracts for products or services. Further, to assure that the lowest possible cost is achieved, the Judiciary may enter into cooperative purchasing agreements with other governmental entities.

Whenever practicable, the Judiciary may use the facilities of the Department of Administration Centralized Purchasing Office, and/or the common services and facilities available to other state entities including but not limited to payroll, central mail room, motor pool and data processing.

Whenever such services are rendered on a cost basis to other state entities, the same charges will apply to the Judiciary.

Article V. Waivers/Deviations

These regulations standardize the manner in which products and services are procured in the Judiciary to the greatest extent possible. Any deviation from the instructions contained herein shall be supported by a waiver signed by the Chairperson of the Judicial Purchasing Committee.

Article VI. Procurement Integrity

Judicial employees are held to the highest standards of conduct in the performance of their duties and must conduct themselves so as to avoid even the appearance of any impropriety. All employees of the Judiciary are to conduct all dealings with potential offerors and contractors in such a manner that no actual occurrence of, or appearance of, favoritism or competitive advantage is given to one business over another in dealing with the Judiciary in accordance with Rhode Island Code of Ethics and Regulations, Chapter 36, Title 14.

The State Court Administrator shall have authority to impose sanctions, in accordance with personnel regulations, on any Judiciary employee who has been found to have violated these regulations.

Article VII. Access to Information

Awarded contracts will generally be available for public inspection, including the successful offer to the extent the offer is incorporated by reference into the contract, including the disclosure of fixed unit prices. However, trade secret information, and confidential or commercial information will not be released.

Article VIII. Judicial Purchasing Committee and Judicial Purchasing Structure

Section 8.01 Judicial Purchasing Committee

There shall be a Judicial Purchasing Committee which shall consist of the Director of Finance/Chief Purchasing Officer, who shall be chairperson; Deputy Director of Finance, who shall be vice chairperson; Assistant State Court Administrator for Technology; Assistant State Court Administrator for Facilities and Operations; and the Judicial Purchasing Agent, who shall be Secretary, or their respective designees.

A quorum shall consist of three (3) members. The Judicial Purchasing Committee may delegate its authority to the Judicial Purchasing Agent, or any other agent(s) and/or employee(s) of the Judiciary.

A. Responsibilities of the Judicial Purchasing Committee

The responsibilities of the Judicial Purchasing Committee shall include but are not limited to:

1. hearing and deciding appeals on bids;

2. developing rules and regulations when necessary, which shall provide for the efficient and effective purchasing function within the Judiciary;

3. ensuring that all procurement activities foster effective competition, such that economies in expenditure can be obtained;

4. administering all procurement activities and determinations with respect to the solicitation and evaluation of competitive offers and to source selection;

5. acting as the sole point of contact with prospective and current offerors, relative to the business, financial and other commercial aspects of all solicitations and offers;

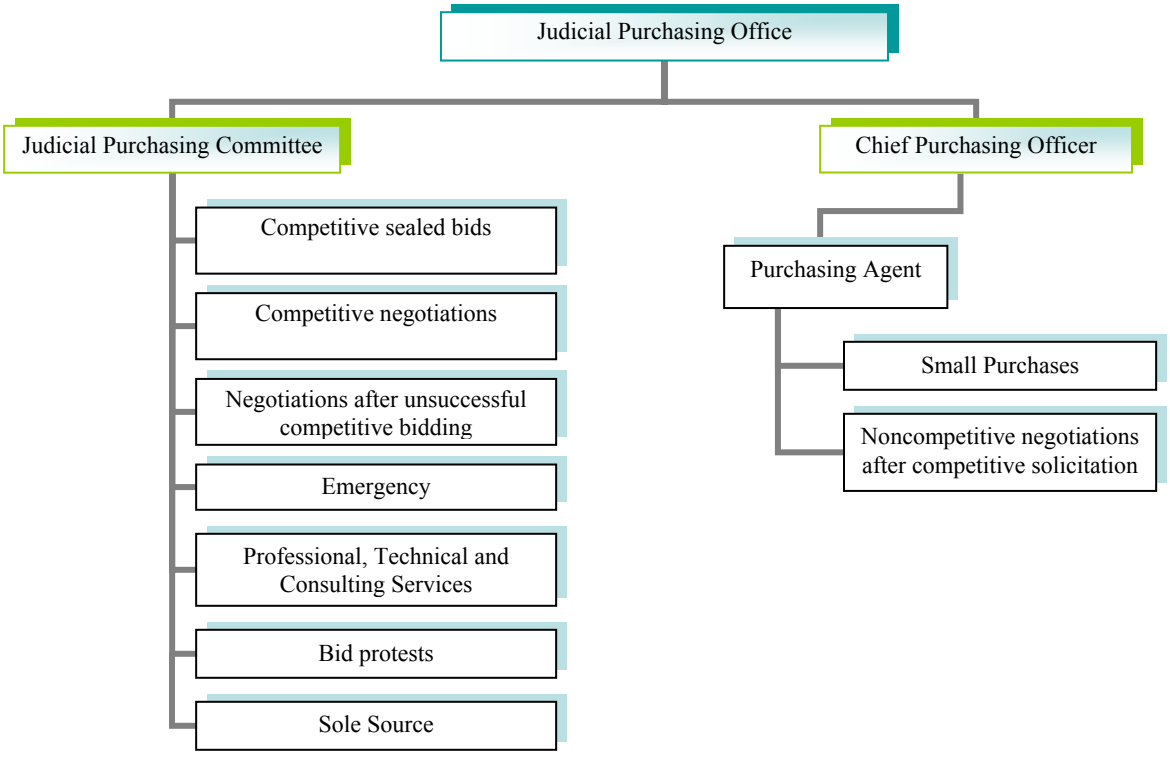
6. issuing specifications for supplies, services, and construction required by the Judiciary;

7. ensuring that all solicitations are prepared in a manner and form which enables suppliers to submit fully responsive and knowledgeable offers, and which clearly define the criteria to be used in evaluating responses;

B. Meetings of the Judicial Purchasing Committee

The Judicial Purchasing Committee shall meet as circumstances require, but in no event, less than once every one hundred eighty (180) calendar days.

C. Judicial Purchasing Structure and Responsibilities



The Judicial Purchasing Committee may establish committees, subcommittees or workgroups as necessary to advise and assist it in carrying out its responsibilities, duties and powers under these Rules and Regulations. The committees, subcommittees or workgroups may be composed of members of the Judicial Purchasing Office, employees of the Judiciary, and/or other persons with the knowledge of the issues or areas of interest that arise before the Judicial Purchasing Committee in the performance of its duties. The committees, subcommittees or workgroups may monitor, study, report and make recommendations to the Judicial Purchasing Committee on any matter that arises during the exercise of its purchasing authority.

Section 8.02 Chief Purchasing Officer

The Chief Purchasing Officer shall attempt in every practicable way to insure that the Judiciary is supplying its needs at the lowest possible cost. The Chief Purchasing Officer shall have the power: to transfer between courts, to salvage, to exchange, and to condemn supplies, and equipment.

The State Court Administrator shall require the Chief Purchasing Officer to furnish an estimate of specific needs for supplies, materials, and equipment to be purchased by competitive bidding for the purpose of permitting scheduling of purchasing in large volume.

The Chief Purchasing Officer, except as otherwise provided by law, shall purchase, or delegate and control the purchase of, the combined requirements of the Judiciary including, but not limited to, interests in real property, contractual services, rentals of all types, supplies, materials, equipment, and services, except competitive bids may not be required:

(a) For contractual services where no competition exists such as sewage treatment, water, and other public utility services;

(b) When instructional materials are available from only one source;
(c) Where rates are fixed by law or ordinance;
(d) For library books, research or reference materials, services or software;
(e) For commercial items that are purchased for resale;
(f) For professional, technical, or artistic services;
(g) For all other commodities, equipment, and services which, in the reasonable discretion of the Chief Purchasing Officer, are available from only one source;
(h) For interests in real property.
(i) For works of art for museum and public display;
(j) For published books, maps, periodicals, newspaper or journal subscriptions, and technical pamphlets;
(k) For licenses for use of proprietary or patented systems; and
(l) For services of visiting speakers, professors, performing artists, and expert witnesses.

Nothing in this section shall deprive the Chief Purchasing Officer from negotiating with vendors who maintain a general service administration price agreement with the United States of America or any agency thereof or other governmental entities, provided, however, that no contract executed under this provision shall authorize a price higher than is contained in the contract between the general service administration and the vendor affected.

Section 8.03 Judicial Purchasing Agent

Within the Judiciary, there shall be a Judicial Purchasing Agent who shall be designated by the Chief Purchasing Officer with the approval of the State Court Administrator, who shall exercise the powers and duties as set forth in these rules and regulations. The Judicial Purchasing Agent shall have the following authorities and responsibilities unless otherwise provided:

(a) To serve as the central procurement and contracting agent of the Judiciary;

(b) To recommend regulations, rules, and procedures to the Chief Purchasing Officer;

(c) To purchase or otherwise acquire, or, with the approval of the Chief Purchasing Officer, to delegate the purchase and acquisition of all supplies, services, and construction for the Judiciary; and

(d) Any other such duties and responsibilities as the State Court Administrator or Judicial Purchasing Committee shall require.

Article IX. Definitions

The terms contained in these rules and regulations shall be defined according to Rhode Island General Laws Title 37, Chapter 2 and the Department of Administration's Division of Purchases Rules Regulation and General Conditions of Purchase unless the context in which they

are used clearly requires a different meaning or a different definition is prescribed for a particular section, group of sections, or provisions.

Article X. Methods of Source Selection

The Judicial Purchasing Committee or the Chief Purchasing Officer may at any time, determine that it is in the best interest of the Judiciary to utilize those procurement practices and procedures as presently in place through the State of Rhode Island Division of Purchases.

When acquiring products or services, procuring officials must consider the following sources:

Section 10.01 Master Price Agreement (MPA)

A Master Price Agreement (MPA) may be either a Judiciary-wide contract or a State of Rhode Island Division of Purchases contract that takes advantage of buying power and ensures that the Judiciary, through negotiated pricing, obtains the best overall value for products and services for which there are repetitive purchases, taking into account overall pricing structure; quality, delivery and service; support, training, exchange and return policies; compatibility with judicial systems and technology; financial stability; and other judicial requirements.

The Judicial Purchasing Committee may establish a Master Price Agreement under any schedule contract to fill repetitive needs for products or services, but shall use Master Price Agreements adopted by the Rhode Island Judiciary whenever feasible.

Section 10.02 Competitive Sealed Bidding

Competitive sealed bidding means the competitive procurement of products and services made under procedures other than those applicable to small purchase procedures, or as otherwise specifically provided herein. The Judicial Purchasing Committee recognizes that special circumstances may not support the use of competitive bidding. *See Exceptions*. Factors to be considered in determining if competitive sealed bidding is practicable shall include whether specifications can be prepared which permit award on the basis of either the lowest bid price or the lowest evaluated bid price, the available sources, the time and place of performance, and other relevant circumstances appropriate for the use of competitive sealed bidding.

The Judicial Purchasing Committee shall ensure that all procurement activities foster effective competition, such that economies in expenditure can be obtained. A competitive environment shall be considered to exist when two or more items or offers can be compared to determine relative merit and/or objective standards of comparison are fairly and impartially applied. An equal opportunity for participation in any procurement applies to all prospective offerors, and affirmative action to achieve participation in the procurement process as a means of achieving social objectives is accomplished without violation of these general principles.

Except as otherwise provided for herein, the Judicial Purchasing Committee shall be responsible for the administration of all procurement activities and determinations with respect to the solicitation and evaluation of competitive offers, and to source selection.

Information concerning the competitive sealed bidding process shall be confidential.

A. Standards and Specifications

The Judicial Purchasing Committee or its designee shall have the responsibility for issuing specifications for supplies, services, and construction required by the Judiciary. Among its duties, it shall, to the greatest extent practicable:

1. Prepare and issue standard specifications for supplies, services, and construction required by the Judiciary.
2. All specifications shall be drafted so as to maximize, to the extent practicable, competition in fulfillment of the Judiciary requirements.
3. Solicitations shall be prepared in a manner and form which enables suppliers to submit fully responsive and knowledgeable offers, and which clearly define the criteria to be used in evaluating responses.
4. All material submitted by requisitioners to the Judicial Purchasing Office for action shall be in sufficient detail and shall contain adequate supportive information to:
   (i) Adequately describe the purpose, use, or desired performance level of the requirement; and
   (ii) Identify measurable criteria for evaluation of offers including, but not limited to, acceptance testing.
   (iii) Wherever possible, solicitations shall incorporate a standard specification, describing the level of performance required, and measurable criteria which define acceptance.
5. In certain cases, following detailed evaluation, brand name or other designations may be defined as standard items, where it is determined to be in the best interest of the Judiciary with regard to economies of scale, or cost or value analysis.

Unless alternate offers are clearly requested or allowed, only those offers which are responsive, in all material respects, to the terms of the solicitation shall be considered. Alternate specifications may be considered only where it has been determined that the alternate satisfies all objective performance characteristics of the procurement, and represents a reduction in expenditure.

B. Solicitations

Unless otherwise specifically authorized, the Judicial Purchasing Committee shall be the sole point of contact with prospective and current offerors, relative to the business, financial and other commercial aspects of all solicitations and offers.

Judicial employees may be authorized by the Judicial Purchasing Agent to contact suppliers to obtain technical data only prior to the award of a contract.

At least one representative of the Judicial Purchasing Committee shall be present at, or party to, all discussions with suppliers with respect to current solicitations, or with respect to price or delivery information, or with respect to modifications of any contract.

1. Method of Solicitation

The Judicial Purchasing Committee will ensure that all solicitations are prepared in a manner and form which enables suppliers to submit fully responsive and

knowledgeable offers, and which clearly define the criteria to be used in evaluating responses. In general, solicitations will be sent only to those suppliers who have formally expressed a desire to bid on the particular types of items which are the subject of the bid solicitation; however, the Judicial Purchasing Agent may determine that competition would be enhanced by soliciting bidders who are not on the established Judiciary Bidders List.

2. Content of Solicitation

The Judicial Purchasing Committee shall have the responsibility for issuing specifications for supplies, services, and construction required by the Judiciary. Competitive bids shall be obtained from a sufficient number of suppliers to be considered representative of the industry cited. Although three bids shall be considered the minimum, the Judicial Purchasing Committee may in some instances declare the existence of two bids to be considered to provide adequate price competition.

The invitation for bids shall state whether award shall be made on the basis of the lowest bid price or the lowest evaluated or responsive bid price. If the latter basis is used, the objective measurable criteria to be utilized shall be set forth in the invitation for bids, if available.

Selection and evaluation criteria shall be clearly defined in all solicitations.

3. Notification and Advertising

The Chief Purchasing Officer will determine the method by which the solicitation is delivered to potential offerors. This determination will take into consideration such choices as sent via regular mail, or electronic mail, print advertisement or publication, or posted on a website. Advertisements may be placed in publications or on websites directed to minority communities and/or women to enhance opportunities for disadvantaged businesses to participate in the bidding process.

Notices shall be published in sufficient time to afford suppliers a fair opportunity to respond prior to the bid opening date and time, not less than seven (7) days nor more than twenty-eight (28) days before the date set for the opening of the bids. The Judicial Purchasing Agent may make a written determination that there is a need to waive the twenty-eight (28) day limitation. The written determination shall state the reason why the twenty-eight (28) day limitation is being waived and shall state the number of days, giving a minimum and maximum, before the date set for the opening of bids when public notice is to be given.

Advertisements may be utilized in conjunction with requests for quotations or proposals for products or services at any estimated level of expenditure if the Chief Purchasing Officer so determines:

(i) that the commodity or service is of such special nature that opportunities for competition will be enhanced by extending invitations to other than known suppliers; and/or

(ii) that a purchase will be of interest to supportive industries, e.g. construction projects; and/or
(iii) that a purchase is unusually large or infrequent.

The Chief Purchasing Officer may advertise in widely circulated newspapers and/or trade journals to promote effective competition.

4. Amendment or Cancellation of Solicitation

An invitation for bids, a request for proposals, and other solicitation may be cancelled or amended, or all bids or proposals may be rejected, if it is determined in writing that the action is taken in the best interest of the Judiciary and approved by the Judicial Purchasing Committee.

An amendment to a solicitation must be issued in sufficient time to permit offerors to consider it in submitting or modifying their offers.

C. Receipt of Offers

Bids shall be opened publicly at the time and place designated in the invitation for bids. Each bid, together with the name of the bidder, shall be recorded and an abstract made available for public inspection.

D. Withdrawal or Correction of Offers

Correction or withdrawal of bids may be allowed only to the extent permitted by the Judicial Purchasing Committee. The Judicial Purchasing Committee shall be the sole determiner of whether correction or withdrawal of bids may be made without penalty.

Requests by the apparent low bidder for correction of bids identifying all error(s) and specifying corrective action shall be submitted in writing to the Judicial Purchasing Committee and shall be re-evaluated with all other offers. Requests for withdrawal of bids shall be submitted in writing to the Judicial Purchasing Agent, providing an explanation for the action and advising the Judicial Purchasing Committee as to why the bidder should not be suspended from the Judiciary Bidders List.

Correction of a bid at any time prior to bid opening may be permitted by the Judicial Purchasing Committee without penalty when a bidder requests that the bid be returned and a corrected bid resubmitted prior to the bid opening. A vendor who fails to resubmit a corrected bid before the bid opening shall be considered nonresponsive.

The Judicial Purchasing Committee shall respond to requests for correction or withdrawal within ten (10) working days, notifying the bidder of the status of his bid and continued inclusion in the Judiciary Bidders List.

E. Evaluation of Offers

Offer evaluation is an assessment of both the offer and the offeror's ability (as demonstrated by the offeror) to perform the prospective procurement successfully. Offers shall be evaluated by the Judicial Purchasing Committee or its designee on the basis of:

1. The qualifications and reliability of the offerors, established by professional accomplishment and previous experience;
2. The quality of the materials, equipment, services, or supplies to be furnished;
3. The conformity of the offer with the specifications;
4. The purposes for which required;
5. The terms of delivery;
6. Aspects of offers which provide benefit, other than those based on cost; and
7. Other provisions of offers which are determined to serve the best interests of the Judiciary.

Nothing herein shall be construed to preclude the possibility of determining an award solely on the basis of cost. The evaluation of offers, including the weight assigned to various aspects of the offerors, and all award determinations, including the reasons for a selection recommendation, shall be fully documented.

All offers received by the Judicial Purchasing Committee may be rejected if the Judicial Purchasing Committee determines that (1) the prices proposed are unreasonable and discussions have not resulted in a reasonable price or price; (2) all offers are technically unacceptable; or (3) offers were not independently arrived at in open competition, were collusive, or were submitted in bad faith. Under any such circumstances, the Judicial Purchasing Committee may declare all bids unacceptable and re-solicit the procurement.

If a solicitation results in only one proposal, the Judicial Purchasing Committee may evaluate and consider the bid for award or declare the bid unacceptable and either re-solicit the procurement or ask that the price be negotiated with the vendor.

The Judicial Purchasing Committee may eliminate bidders whose offers are clearly noncompetitive prior to resolicitation.

F. Awards

The bid will be awarded to the offeror whose offer receives the highest evaluation in accordance with the specifications of the bid. Evaluations can be made based on the technically acceptable/lowest price of the offeror who meets the technical requirements in the solicitation or based on best value. The contract shall be awarded with reasonable promptness by written notice to the responsive and responsible bidder whose bid is either the lowest bid price or lowest evaluated or responsive bid price.

Bids may not be withdrawn during this period without penalty without the express permission of the Judicial Purchasing Committee.

The Judicial Purchasing Committee may, after considering the overall cost to the Judiciary prior to making a final determination of award, apply special consideration to the offers of minority business enterprises when:

1. the solicitation provides for such consideration;
2. the offer is fully responsive to the terms and conditions of the solicitation;
3. the price offer made by the MBE is determined to be within a competitive range (not to exceed five percent (5%) higher than the lowest responsive price offer) for the product or service; and
4. the firm making the offer conforms to the definition of a minority business enterprise.

An award may be made by written acceptance of an offer or by execution of a procurement by both parties.

G. Negotiations After Unsuccessful Competitive Sealed Bidding

1. In the event that all bids submitted pursuant to competitive sealed bidding under Section 10.02 ("Competitive Sealed Bidding") result in bid prices in excess of the funds available for the purchase and the Chief Purchasing Officer determines in writing:

(i) That there are no additional funds available from any source so as to permit an award to the lowest responsive and responsible bidder, and

(ii) The best interest of the state will not permit the delay attendant to a resolicitation under revised specifications, or for revised quantities, under competitive sealed bidding as provided in Section 10.02 ("Competitive Sealed Bidding"), then a negotiated award may be made as set forth in subsection (2) or (4) of this section.

2. Where there is more than one bidder, competitive negotiations, pursuant to Section 10.02 ("Competitive Sealed Bidding"), shall be conducted with the three (3) or two (2) if there are only two (2) bidders, determined in writing to be the lowest responsive and responsible bidders to the competitive sealed bid invitation. Competitive negotiations shall be conducted under the following restrictions:

(i) If discussions pertaining to the revision of the specifications or quantities are held with any potential offeror, all other potential offerors shall be afforded an opportunity to take part in such discussions; and

(ii) A request for proposals, based upon revised specifications or quantities, shall be issued as promptly as possible, shall provide for an expeditious response to the revised requirements, and shall be awarded upon the basis of the lowest bid price, or lowest evaluated bid price submitted by any responsive and responsible offeror.

3. Contracts may be competitively negotiated when it is determined in writing by the Judicial Purchasing Agent that the bid prices received by competitive sealed bidding were not independently reached in open competition, and for which:

(i) Each competitive bidder has been notified of the intention to negotiate and is given reasonable opportunity to negotiate; and

(ii) The negotiated price is lower than the lowest rejected bid by any competitive bidder; and

(iii) The negotiated price is the lowest negotiated price offered by a competitive offeror.

4. When, after competitive sealed bidding, it is determined in writing that there is only one responsive and responsible bidder, a negotiated award may be made with the bidder.

H. Protest Procedures

A mere disagreement with the decision of the Judicial Purchasing Committee does not constitute grounds for a protest. A "protest" for purposes of these procedures is a written objection by an interested party to any of the following:

- a solicitation of other requests for offers for the procurement of products or services;
- an award or proposed award of a procurement; and
- a cancellation of the solicitation or other request.

1. Interested Parties

For purposes of filing a protest, an interested party means an actual or prospective offeror whose direct economic interest would be affected by the award of a procurement or by the failure to award a procurement.

2. Filing and Form of Protest

A Judiciary protest must be filed in writing with the Chief Purchasing Officer with a copy to the Judicial Purchasing Committee within two (2) calendar weeks after the interested person knows or should have known of the facts giving rise to the protest. A statement of intent to file a protest is not a protest.

Protests must include the protestor's name, address and telephone number, fax number and email address, the solicitation or procurement number, the identity of the contracting activity, and a detailed statement of all legal and factual grounds for the protest including a description of the alleged prejudice to the protestor, copies of all relevant documents, a request of relief and the protestor's suggested form of relief, all information establishing that the protestor is an interested party, and proof of timeliness.

3. Protest Decision

The Chief Purchasing Officer shall forward the protest to the Judicial Purchasing Committee along with his explanation and recommendation. The Judicial Purchasing Committee or its designee shall issue a written decision on the protest within ten (10) business days after the filing of the protest that provides sufficient explanation for the basis of the decision.

4. Protest Filed Before Award

When a timely protest has been filed with the Chief Purchasing Officer before award, award may not be made until the matter has been resolved, unless the Chief Purchasing Officer with the concurrence of the Judicial Purchasing Committee determines in writing that urgent and compelling circumstances which significantly affect the interests of the Judiciary will not permit delay of the award until the protest has been resolved, and that the award must be made without awaiting the decision. When authorized to make an award before a protest is resolved, the Chief Purchasing Officer must inform the protestor in writing of the Judiciary's determination to proceed with the award.

5. Protest Filed After Award

When a protest is filed within two (2) calendar weeks after an award, the Chief Purchasing Officer shall immediately suspend performance pending resolution of the protest by the Judicial Purchasing Committee or its designee. Performance need not be suspended in those circumstances where the Chief Purchasing Officer determines in writing, that urgent and compelling circumstances exist or it is otherwise in the best interests of the Judiciary to allow the contractor to proceed. Prior to making such a determination, the Chief Purchasing Officer must consult with and obtain the approval of the Judicial Purchasing Committee.

Section 10.03 Competitive Negotiations

Competitive negotiation shall mean a specialized bidding procedure characterized by modifications to the offers of at least two vendors and/or alteration of the specifications for which, or the terms and conditions under which, the state has solicited offers.

A contract may be awarded by competitive negotiation when the Judicial Purchasing Agent determines in writing that the use of competitive sealed bidding is not practicable where:

- Lowest price is not the sole or primary consideration to be used in determining an award; or
- Performance is neither specific nor objective, and open to the offeror's interpretation; or
- It is otherwise anticipated that offers may be substantially different and that there is insufficient common ground for objective comparison; or
- It is anticipated that changes will be made after proposals are opened and that the nature of the proposals and/or prices offered will be negotiated prior to award.

Requests for Proposal (RFP) shall be utilized to solicit competitive offers.

A. Content of Request for Proposal

1. Wherever possible, the Request for Proposal shall define the performance or benefit required and shall set forth specific criteria to be utilized in evaluation of offers.
2. The request for proposals shall indicate the relative importance of price and other evaluation factors.

B. Procedure for Competitive Negotiations

Adequate public notice of the request for proposals to be negotiated shall be given in the same manner as Competitive Sealed Bidding as provided in Section 10.02(B)(3) ("Notification and Advertising").

Written or oral discussions may be conducted with all responsible offerors who submit proposals determined in writing to be reasonably susceptible of being selected for award. Discussions shall not disclose any information derived from proposals submitted by competing offerors. Award shall be made by the Judicial Purchasing Committee or its designee(s) to the responsible offeror whose proposal is determined in writing to be the most advantageous to the Judiciary, taking into consideration price and the evaluation factors set forth in the request for proposals. Discussions need not be conducted:

(1) With respect to prices, where the prices are fixed by law or regulation, except that consideration shall be given to competitive terms and conditions;

(2) Where time of delivery or performance will not permit discussions; or

(3) Where it can be clearly demonstrated and documented from the existence of adequate competition or accurate prior cost experience with the particular supply, service, or construction item that acceptance of an initial offer without discussion would result in fair and reasonable prices, and the request for proposals notifies all offerors of the possibility that an award may be made on the basis of the initial offers.

Section 10.04 Non Competitive Negotiations

Non competitive negotiation shall mean the establishment of contractual terms and conditions, including but not limited to contract price, by discussions with a single vendor, outside of the procedures established for competitive bidding.

Section 10.05 Exceptions

The following exceptions to competitive bidding are permitted; however, the Judicial Purchasing Agent and/or Judicial Purchasing Committee may require competitive bidding in any circumstance where it is determined that competition may enhance the Judiciary's ability to attain cost savings:

- Contractual services where no competition exists, such as telephone service, electrical energy, and other public utility services;
- Instructional materials available from only one source;
- Where rates are fixed by law or ordinance;
- Library books, research or reference materials, services or software;
- Professional, technical, or artistic services
- Goods or services obtained by one state agency from another (such as printing or services from Prison Industries or use of Central Service Accounts)

Competition should be sought for any open market purchase unless:

- Exigencies require the immediate delivery of the products or performance of the services due to unusual and compelling urgency (**emergency**);
- Only one responsible source of supply is available and no other products or services will satisfy Judiciary requirements (**sole source**);
- The services are required to be performed by a contractor or consultant in person and are of a professional, technical or consulting nature (**professional, technical and consulting assistance**); or
- The purchase is an open market fixed price purchase for a product or service up to $5,000 (**small purchase)**.

A. Emergency

The Judicial Purchasing Committee shall be permitted to react quickly to critical or urgent situations when the cost for a remedy or repair and there is not sufficient time to undertake a public, formal, or informal bidding process.

Notwithstanding any other provision of this chapter, the Judicial Purchasing Committee may make or authorize others to make emergency procurements when there exists an unusual and compelling urgency, including but not limited to failures of critical equipment, a threat to public health, welfare, or safety under emergency conditions; provided, that the emergency procurements shall be made with such competition as is practicable under the circumstances.

A written determination of the basis for the emergency, and for the selection of the particular contractor, shall be included in the contract file.

B. Sole source

The Judiciary shall take all reasonable steps to avoid contracting without providing for full and open competition, however, there are valid circumstances when it is both necessary and in the best interest of the Judiciary to award a sole source procurement.

Sole source is a term used to designate that only one responsible supplier exists that is capable of providing a particular product or service. Sole source purchases are an exception to the judicial competitive bidding policy, and must always be in writing. The Judicial Purchasing Committee will approve sole source purchases on a case-by-case basis. In the case of an emergency, the Chief Purchasing Officer or his designee may serve as the authority for sole source purchasing.

1. *Sole source categories may include*:
   - (a) items of a unique nature which are unavailable from other sources due to patents or proprietary processes;
   - (b) books, maps, periodicals, and technical pamphlets, films, video and audio cassettes obtained from publishers;
   - (c) certain computer software;
   - (d) licenses - computer software, electronic transmittal;
   - (e) specialized replacement/repair parts or expansion parts necessary to maintain the integrity of system or function, e.g. scientific research;

(f) works of art for museum or public display;

(g) specialized services for which there is only one documented accepted source, such as transactions involving unique professional services and/or educational institutions, e.g., visiting speakers or professors, and performing artists; repair/maintenance agreements with manufacturers;

(h) advertisements, public notices in magazines, trade journals, newspapers, television, public relations and advertising campaign services;

(i) maintenance contracts based upon sole source determination shall be subject to the following:

(a) Annual maintenance contracts not covered by a master price agreement (MPA) in excess of $50,000 shall require approval by the Judicial Purchasing Committee.

(b) All multi-year contracts shall require approval by the Judicial Purchasing Committee.

(j) services provided by certain non profit agencies

(k) Guest speakers, honoraria, subscriptions, dues, memberships and other similar items will be treated as sole source, and do not require sole source justification documentation.

C. Professional, Technical and Consulting Assistance

The Judiciary shall be permitted to retain such professional, technical and consulting services as it deems necessary, including but not limited to legal, medical, dental, architectural, or engineering services, and to set the amounts and terms of such service contracts, subject to the approval of the Judicial Purchasing Committee.

D. Small Purchases

Small purchase procedures are for use in making open market fixed price purchases for products or services up to $5,000, with competition via competitive sealed bidding, competitive negotiation or informal competitive bids, or without competition, provided that the Judicial Purchasing Agent determines the price to be reasonable.

E. Informal Competitive Bids

Oral quotations (including telephone) may be solicited for small purchase orders. If the Judicial Purchasing Agent is unable to verify prices using published lists/catalogs or by market analysis, the lowest quotation obtained by telephone solicitation for procurements shall be confirmed in writing.

An informal bid shall be distinguished by:

(a) lack of a specific time by which bids must be submitted;

(b) lack of sealed written bids; quotes may be oral on the spot or by telephone and confirmed at a later date in writing;

(c) lack of an opening and reading of bids;

(d) the solicitation of selected registered or unregistered bidders who are potential suppliers for the commodity or service to be procured and/or vendors suggested for consideration.

Informal bids shall be solicited from a minimum of three suppliers. All informal bid invitations shall be conducted in such fashion as to maximize the opportunity for participation of all responsible suppliers.

When informal competitive bids are received in accordance with the provisions contained herein and award is not made to the low bidder, the file shall be annotated with statements of how the supplier was selected and why the price is fair and reasonable.

F. Direct Billing

Direct invoicing, the means of paying a bill without having to create a purchase order, should be done for the following instances:

a. Utilities;
b. Food;
c. Telephone bills;
d. Registration fees; and
e. In-state travel reimbursement.

Bills that meet these criteria should be forwarded to the Judiciary's Accounts Payable Department for payment.

Article XI. Contractor Prequalification, Qualification and Solicitation

The Judiciary shall procure from responsible contractors only. Therefore, the Judicial Purchasing Committee must not solicit offers from, award procurements to, or consent to subcontracts with debarred, suspended, or ineligible contractors or affiliates thereof, unless the Judicial Purchasing Committee determines that there is a compelling reason for such action in the interest of the Judiciary.

- A reasonable inquiry to determine the financial strength and responsibility of a business which is a bidder or offeror shall be conducted and a written determination of responsibility shall be made. Said financial analysis may include the review of the business by a nationally recognized commercial credit reporting bureau. Credit bureau reports may be required by the Chief Purchasing Officer in conjunction with a financial analysis.

- Except as otherwise provided by law, information furnished by a bidder or offeror pursuant to this section may not be disclosed outside of Judiciary without prior written consent of the bidder or offeror.

Section 11.01 Definitions

A. Registered Suppliers- the names of interested suppliers who have submitted completed Judiciary Bidder Registration Forms to the Judicial Purchasing Office that have been reviewed and approved by the Judicial Purchasing Agent.

B. Unregistered Suppliers - suppliers that have not expressed interest in selling to the Judiciary by submitting a Judiciary Bidder Registration Form, but who have been determined by the Judicial Purchasing Agent, due to the nature of the firm's status in the market, to be responsible and qualified with regard to particular commodities. Inclusion of any firm on the Judiciary Bidders List without a supporting registration form shall be permitted with the written approval of the Judicial Purchasing Agent.

Section 11.02 Responsibilities of Bidders and Offerors

A written determination of responsibility of a bidder or offeror shall be made by the Judicial Purchasing Agent**.** The Judicial Purchasing Agent may utilize factors such as financial capability, reputation, management, etc., to evaluate the responsibility and qualifications of potential suppliers in order to develop a list of prospective bidders qualified to be sent invitations to bid. The failure of a bidder or offeror to supply information promptly (within 5 business days or unless otherwise specified) in connection with an inquiry related to responsibility may be grounds for a determination of nonresponsibility.

The Judicial Purchasing Agent may disqualify a supplier, contractor, or subcontractor from participating in Judiciary Bidding Lists. Just cause for such determination may include but shall not be limited to:

- Lack of a properly prepared and submitted Bidder Registration Form;
- Refusal to submit a Bidder Registration Form;
- Falsification of information on Bidder Registration or Certification Forms;
- Suspension or debarment by the federal government or the Rhode Island Department of Administration;
- Conviction of fraud or perjury;
- Lack of competence, financial responsibility, or other limitations related to the ability of a supplier to provide the goods and services indicated on its Bidder Registration Form;
- Failure of a bidder or offeror to promptly supply information in connection with an inquiry, including but not limited to financial statements and business references, shall be grounds for a determination of nonresponsibility with respect to such a bidder or offeror; or
- Any reason stipulated in Section 11.08 entitled “Vendor Disqualification” of these regulations.

Based on the Judicial Purchasing Agent's review of a supplier's level of financial responsibility and/or qualification, the Judicial Purchasing Agent may restrict the items or size of orders for which a supplier will be solicited. Restriction shall relate to:

- limiting the kinds of goods and services for which the supplier may be solicited to a portion of those indicated on a Bidder Registration Form.
- limiting the scope/amount of goods and services for which the supplier may be solicited (e.g., categorizing a contractor by the size of construction projects it is deemed capable of undertaking).

Section 11.03 Bidder Registration Form

The Judicial Purchasing Agent may require interested suppliers to submit completed Bidder Registration Forms to the Judicial Purchasing Office for consideration by the Judicial Purchasing Agent. If required bidder certifications are determined to be invalid, the Purchasing Agent may declare the purchase order void.

A copy of the Judiciary's General Terms and Conditions of Purchase shall be made available with the Bidder Registration Form.

The Bidder Registration Form shall be signed by a representative of the supplier who has the capacity to enter into contracts. The signature shall be an original signature made in ink and dated by the signatory. The signature shall affirm that:

- any and all information on the Registration Form is true and accurate;
- the existence of relationship (blood, spousal, adoptive, financial, etc.) between a principal of the firm and any State/Judiciary employee where a conflict of interest may exist has been disclosed; and
- that falsification of information contained on a signed Registration Form may be grounds for criminal charges of perjury and that conviction of such charges may be grounds for debarment.

As a prerequisite condition for contract award, the Judicial Purchasing Agent may require any bidder to complete a Bidder Registration Form and/or submit current certifications of financial responsibility, affirmative action compliance, drug-free free environment, and status as small, women-owned and/or disadvantaged businesses.

The Judicial Purchasing Agent may require registered suppliers to resubmit updated Bidder Registration Forms annually.

Section 11.04 Bidder Registration Fee

The Chief Purchasing Officer may adopt regulations to establish an annual fee, of not less than twenty-five dollars ($25.00), which shall be paid by all potential bidders requesting to subscribe to solicitation mailings for public bids for specific types of supplies, services, and construction during a fiscal year, and may waive said fee for Rhode Island firms. Additionally, the Chief Purchasing Officer may delegate to the Judicial Purchasing Agent the authority to waive said fee for an individual solicitation and to include unregistered bidders in the solicitation in the interest of expanding competition. Nothing herein shall prevent any interested party from submitting a bid in response to any solicitation of which they become aware.

Section 11.05 Vendor Information Files

The Judicial Purchasing Office shall maintain Vendor Information Files for the following documentation purposes:

A. <u>General</u>
   - Bidder Registration Forms

- Results of investigations for prequalification, responsibility, suspension, debarment, restriction, and nonperformance
- Certifications
- Correspondence

B. Bidding History

C. Performance History

- Solicited and unsolicited reports regarding contract performance (e.g., quality, responsiveness) shall be recorded in the Vendor Information File.
- Complaints shall be investigated by Judicial Purchasing Office staff, the results submitted to the Judicial Purchasing Agent for adjudication, and the results documented and maintained in the Vendor Information File.

Potential bidders who have been determined by the Judicial Purchasing Agent to be brokers or jobbers shall not be included on Judiciary Bidders Lists.

Firms bidding on construction or building renovation must demonstrate an ability to perform a substantial portion of the subject work using their own forces. Bidders who do not maintain permanent workforces, or who propose to subcontract a disproportionate percentage of project work shall be considered unqualified, and the Judicial Purchasing Agent reserves the right to reject their offers.

Section 11.06 Prequalification of Contractors

The Chief Purchasing Officer may provide for prequalification of suppliers as responsible prospective contractors for particular types of supplies, services, and construction. Solicitation mailing lists of potential contractors of such supplies, services, and construction shall include but need not be limited to such prequalified contractors.

Prequalification shall not foreclose a written determination:

(1) Between the time of the bid opening or receipt of offers and the making of an award, that a prequalified supplier is not responsible; or
(2) That a supplier who is not prequalified at the time of bid opening or receipt of offers is responsible.

Prequalification information may be submitted within a time period subsequent to a project bidder's conference, which period has been specified in the bid solicitation.

The Judicial Purchasing Agent may conduct supplementary prequalification examinations of registered bidders prior to solicitation or award which include, but are not limited to:

- requirement for additional certification(s);
- requirement for demonstration of additional licensure;
- requirement for recent financial information;
- submission of an affirmative action employment plan;
- submission of the names of proposed small disadvantaged business; and/or

- subcontractors and the value of such subcontracts.

Inclusion of a supplier on Judiciary Bidders Lists shall not constitute a prequalification determination for a specific procurement.

Section 11.07 Construction Management

A person who bids on a construction management contract shall provide the following information, which information shall constitute the prequalifications for a construction management contract:

A. Firm history

Name of the firm, location of principal and branch offices, length of time in business, firm ownership structure, and annual construction management volume for each of the past five (5) years including number of projects and total construction volume.

B. Personnel

Total number of the firm's personnel, other than secretarial/clerical, by professional or skill group and outside firms which will be used to provide such services as estimating, value engineering analysis, scheduling or computer services.

C. Experience

Information regarding projects which the firm has constructed during the past five (5) years, including those where the firm has served as construction manager: project name and address, year completed, type of project, construction cost, and a reference(s).

D. Project Staffing

1. The firm's proposed management staff for the project, including an organizational chart identifying the firm's key staff members and showing how each staff member interacts with other staff members assigned to the project, and
2. A detailed resume for each key staff member which summarizes education, professional registration, professional society membership, construction experience, and construction management project experience.

E. Services

1. Scope of preconstruction phase services, including how such services are provided, with specific attention to the first budget estimate, methods of cost control, scheduling, value engineering and the method of reporting project status and schedule position;
2. Scope of construction phase services and how such services are to be provided;
3. The firm's method of working with the project architects, engineers, consultants and other planning team members; and
4. The firm's method of coordinating the efforts of various trade contractors.

Section 11.08 Vendor Disqualification

The Judicial Purchasing Agent, with the approval of the Judicial Purchasing Committee, may disqualify a supplier, contractor, or subcontractor from participating in Judiciary procurements. Disqualification may result in any of the following actions being taken:

1. Debarment - permanent removal from Judiciary Bidders Lists and exclusion from all subsequent procurements, and termination of all outstanding Judiciary contracts; or
2. Suspension - temporary removal from Judiciary Bidders Lists and exclusion from subsequent procurements, and termination of outstanding contracts (at the discretion of the Judicial Purchasing Agent) for a specified period of time; or
3. Removal - deletion from Judiciary Bidders Lists, without interruption of outstanding contracts or the ability to participate in subsequent procurements; or
4. Rejection - lack of inclusion on Judiciary Bidders Lists or non-consideration of an offer submitted for a particular procurement, based on lack of demonstrated responsibility or competency.

A. Rejection and Removal

A vendor's offer for a specific procurement may be rejected for any of the causes described for suspension, or where, in the judgment of the Judicial Purchasing Agent, with the approval of the Judicial Purchasing Committee, the vendor does not possess the capacity, capability, or integrity requisite for the procurement.

Failure to respond to three consecutive solicitations for products or services that a vendor has indicated an interest or ability in supplying on a Bidder Registration form, or a demonstrated lack of success in receiving awards, shall constitute grounds for removal from the Judiciary Bidders List(s) in question.

B. Debarment and Suspension from Bidders List

1. Applicability

A debarment or suspension judgment against a part of a corporate entity constitutes debarment or suspension of all of its divisions and all other organizational elements, except where the action has been specifically limited in scope and application, and may include all known corporate affiliates of a contractor, when such offense or act occurred in connection with the affiliate's performance of duties for or on behalf of the contractor, or with the knowledge, approval, or acquiescence of the contractor or one or more of its principals or directors, or where the contractor otherwise participated in, knew of, or had reason to know of the acts.

The fraudulent, criminal or other serious improper conduct of any officer, director, shareholder, partner, employee, or any other individual associated with a contractor may be imputed to the contractor when the conduct occurred in connection with the individual's performance of duties for or on behalf of the contractor, or with the contractor's knowledge, approval, or acquiescence. The contractor's acceptance of benefits derived from the conduct shall be evidence of such knowledge, approval, or acquiescence.

2. Just Cause for Debarment

Just cause for debarment may include, but shall not be limited to:

a. Conviction or final adjudication by a court or administrative agency of competent jurisdiction of any of the following offenses:

- Criminal offense incident to obtaining or attempting to obtain a public contract or subcontract, or the performance of such contract or subcontract, in any jurisdiction, or
- Criminal offense involving embezzlement, theft, fraud, perjury, forgery, bribery, falsification or destruction of records, receiving stolen property (or any other offense indicating a lack of business integrity or honesty which seriously and directly affects the contractor's present responsibility as a public contractor), or
- Violation of state or federal antitrust laws relative to the submission of bids or proposals (including those proscribing price fixing between competitors, allocation of customers between competitors, and bid rigging), or
- Violation of state or federal laws regulating campaign contributions;
- Violation of state or federal laws regulating equal employment opportunity or handicapped access.

b. Violation of the terms of a public agreement or transaction so serious as to affect the integrity of any agency program;

c. Falsification of information on a bid submission or Bidder Registration form, subcontracting plan, or affirmative action plan;

d. Substantial nonperformance on two or more contracts;

e. Debarment by the federal government or the Rhode Island Department of Administration; or

f. Withdrawal, without written permission of the Judicial Purchasing Agent, of two or more bids after an award has been announced.

3. Just cause for Suspension

Just cause for suspension may include, but shall not be limited to:

a. Any cause for debarment, depending on the severity of the violation;

b. An indictment or any information filed by a public agency charging a criminal offense as described above for debarment;

c. Substantial evidence of willfully supplying materially false information incident to obtaining or attempting to obtain or performing any public contract or subcontract, or willful failure to comply with requirements imposed upon contractors or subcontractors by law or regulation;

d. Suspension by the federal government or the Rhode Island Department of Administration;

e. Substantial nonperformance on at least one contract;

f. Lack of responsibility evidenced by:
- Withdrawal of two or more bids within a two-year period, even with the consent of the Judicial Purchasing Agent, or
- Correction following public or formal opening of two or more bids within a two-year period, even with the consent of the Judicial Purchasing Agent, or
- Rejection for non-responsiveness of two or more bids within a two-year period.

g. A vendor or contractor who knowingly engages as a subcontractor, for a contract awarded by the Judiciary, a vendor or contractor then under a ruling of suspension or debarment by the Judiciary shall be subject to disallowance of cost, annulment or termination of award, issuance of a stop work order, debarment or suspension, as may be judged to be appropriate by the Judicial Purchasing Agent.

4. Duration of Suspension

The Judicial Purchasing Agent may suspend a vendor for not less than a three-month and not more than a two-year period, depending on the severity of a particular violation, provided however that where the cause of the suspension is a criminal indictment as described above, the suspension shall remain in force until such time as the court has disposed of the indictment.

5. Pest Control Services

Upon receipt of an order from the Director of Environmental Management pursuant to section 23-25-28(a)(1) RIGL, the Judicial Purchasing Agent shall take such steps as are necessary to insure that the named business or commercial applicator shall not be eligible to receive Judiciary contracts for pest control services for the duration of the period enumerated in said Director's order.

Section 11.09 Notification, Protest and Reconsideration

A. Notice

The Judicial Purchasing Agent shall notify in writing any vendor whom he or she intends to debar or suspend. Such notice shall:

- state the nature of and, in the case of suspension, the duration of the sanction;
- provide the vendor with the rationale for the decision; and
- establish a specific time for reconsideration not less than two weeks nor more than three weeks within which the vendor may provide justification for why such action should not be implemented.

Where issuance of a purchase order or other award to a particular vendor may compromise the best interests of the Judiciary, nothing herein prevents the Judicial Purchasing Agent from directing that a suspension or debarment take effect immediately.

No notice shall be required where the Judicial Purchasing Agent rejects the offer of a bidder for an individual procurement, or removes a registered bidder from one or more Judiciary Bidders List(s), as described above.

B. Protests

Protests of decisions rendered by the Judicial Purchasing Agent shall be administered in accordance with the requirements of section 10.02(H) ("Protest Procedures").

C. Reconsideration

Where reconsideration has been requested in writing by a vendor, the Judicial Purchasing Agent shall, upon expiration of the reconsideration period, notify the affected vendor of his or her final decision. Where no such request is received, the action shall be implemented without notice.

A vendor who has been suspended, or rejected from one or more Judiciary Bidders List(s), shall not be reinstated until he has submitted a written request for reinstatement to the Judicial Purchasing Agent, with evidence that the reason for suspension, rejection, or removal has been corrected.

Section 11.10 Public Works Contracts

Ability to meet performance bond requirements set forth for public works contractor in Chapters 37-12 and 37-13-14 shall be valid criteria for determination of responsibility, provided that the Judicial Purchasing Agent may waive such requirement for good cause for contracts not exceeding fifty thousand dollars ($50,000).

Article XII. General Terms and Conditions of Purchase

Section 12.01 General Terms and Conditions

The Judicial Purchasing Office shall develop and make available to potential suppliers and Judiciary officials a document stating the general terms and conditions applicable to all quotations and judicial purchasing contracts. These terms and conditions are contained in *Appendix A*.

The General Terms and Conditions shall (1) be referenced and made a part of all solicitations for proposals and quotations; all judicial purchase orders, contracts, and letters of authorization; and bidder registration documentation and (2) provide notice to bidders that contract award may be subject to the bidder signing an affirmation (certification) regarding certain legal requirements or restrictions relating to foreign corporations, disadvantaged business enterprises, labor rates, local product preference, etc., as required by the Judicial Purchasing Agent.

When a contract has been entered into between the Judiciary and another party, neither party shall have the legal right to add new terms or conditions without the consent of the other, unless the contract so specifies. Changes in scope, price, and length of contract period shall require contract amendments which are specified in writing. Unanticipated changes may be considered with the express consent of both parties. The issuance of a Purchase Change Order in

accordance with the provisions of the contract and other requirements specified herein shall be considered a binding contract. All contract pricing shall be firm and fixed unless contract language provides for reconsideration, and the length of contract period shall be specified.

A judicial official (or position) from whom the contractor shall obtain direction shall be named and/or a format for written authorization to deliver (e.g., request for delivery form for master pricing agreement) shall be specified.

Issuance of purchase orders shall not be made on the basis of "advise pricing" (or "pricing to be determined") agreements. All commitments shall be on the basis of estimated prices with a "not to exceed" maximum authorization when firm, fixed pricing agreements are not possible.

As appropriate, contracts with the Judiciary shall include clauses which address special conditions/procedures for suspension or termination of a contract not contained in the Judiciary's General Terms and Conditions; e.g., provisions for penalties or forfeitures for contract noncompliance may be included; a convenience termination clause which permits the Judiciary to suspend or terminate, at its own discretion, the performance of work in whole or in part, and to make a settlement of the vendor's claims in accordance with appropriate regulations and applicable contractual conditions.

Section 12.02 Purchase Order Contracts

"Purchase Order" shall mean a document issued by the Judicial Purchasing Agent to formalize a purchase transaction with a vendor. The purchase order shall contain statements as to the quantity, description, and price of the goods or services ordered, applicable terms as to payment, discounts, date of performance, transportation, and other factors or suitable references pertinent to the purchase and execution by the vendor. Purchase orders shall include blanket orders, master pricing agreements, and utility purchase orders.

The entire agreement with the supplier shall, at all times, reside solely in the purchase order and its referenced supplements.

Purchase Order Supplements shall consist of all of the following documents:

1. The Judiciary's General Terms and Conditions of Purchase;
2. The Judiciary's request for quotations or proposals, including specifications;
3. The contractor's offer which is responsive to the solicitation; and/or
4. As appropriate, additional contract provisions.

Article XIII. Multi-Year Contracts

A. Unless otherwise provided, multi-year contracts for supplies and services may be entered into for periods extending beyond the end of the fiscal year in which the contract was made, if funds for the first fiscal year of the contemplated contract are available at the time of contracting and the contract states that payment and performance obligations for succeeding fiscal years shall be subject to the availability of funds therefor.

B. Prior to the utilization of a contract as described in subsection (a) of this section, it shall be determined, in writing, by the Chief Purchasing Officer:

1. That estimated requirements cover the period of the contract, are reasonably firm, and continuing; and

2. That the contract will serve the best interests of the Judiciary by encouraging effective competition or otherwise promoting economics in Judiciary procurement.

C. When funds are not appropriated or otherwise made available to support continuation of performance in a subsequent year of a contract as described in subsection (A) of this section, the contract for the subsequent year may be cancelled and the contractor shall be reimbursed for the reasonable value of any nonrecurring costs incurred but not amortized in the price of the supplies or services delivered under the contract. The cost of cancellation may be paid from:

1. Appropriations currently available for performance of the contract;

2. Appropriations currently available for procurement of similar supplies or services and not otherwise obligated; or

3. Appropriations made specifically for the payment of cancellation costs.

Article XIV. Letter of Authorization

When the Judicial Purchasing Agent determines in writing that it is absolutely essential that the vendor be given a binding commitment so that work can be commenced immediately and that negotiation of a definitive contract cannot be accomplished in sufficient time, the Judicial Purchasing Agent may issue a Letter of Authorization ("LA").

Section 14.01 Definition and Purpose

A Letter of Authorization ("LA") shall mean a written instrument binding only when signed by the Judicial Purchasing Agent, which authorizes immediate commencement of implementation of the delivery of supplies or the performance of services. Such instrument shall:

- Represent a preliminary authorization subject to the subsequent issuance of a Purchase Order.
- Be superseded by a definitive contract at the earliest practicable date not later than the expiration of 180 days from the date of the LA or delivery of 40% of the contract.
- Be specifically negotiated and shall address the following contractual requirements that:
    - the vendor will proceed immediately with performance of the contract, including procurement of necessary materials;

- the extent and method of payments in the event of termination for the convenience of the Judiciary or for default;
- the vendor is not authorized to expend monies or incur obligations in excess of the maximum liability of the Judiciary as set forth in the letter contract;
- the type of definitive contract contemplated;
- as many definitive contract provisions as possible;
- the vendor shall provide such price and cost information as may reasonably be required by the Judiciary; and
- the vendor and the Judiciary shall enter into negotiations promptly and in good faith to each agreement and execute a definitive contract.

Section 14.02 Changes to Purchase Orders

All agreements and changes to scope of work, price, or other terms shall be incorporated into purchase orders via "change order" documents incorporating contract amendments.

Change Orders issued by the Judicial Purchasing Office shall be the only binding documents which may create a change in a purchase order.

Judiciary personnel shall not commit the Judiciary to technical/contractual changes to purchase orders without first securing all necessary approvals.

All discussions of potential changes (oral or written) may be disclaimed as not being binding on the supplier or the Judiciary until formally incorporated in the purchase order.

In general, change orders shall be issued by the Judicial Purchasing Office following receipt of quotations and discussions of price and delivery with the supplier. If circumstances preclude immediate issuance of a formal change order, interim direction to the supplier may be made via a letter of authorization signed by the Judicial Purchasing Agent.

Section 14.03 Suspension or Termination of Contract

A. Suspension of a Contract by the Judiciary

The Judiciary reserves the right at any time and for any reason to suspend all or part of this contract, for a reasonable period, not to exceed sixty days, unless the parties agree to a longer period. The Judiciary shall provide the contractor with written notice of the suspension order signed by the Purchasing Agent or his or her designee, which shall set forth the date upon which the suspension shall take effect, the date of its expiration, and all applicable instructions. Upon receipt of said order, the contractor shall immediately comply with the order and suspend all work under this contract as specified in the order. The contractor shall take all reasonable steps to mitigate costs and adverse impact to the work specified in the contract during the suspension period. Before the order expires, the Judiciary shall either:

(a) cancel the suspension order;
(b) extend the suspension order for a specified time period not to exceed thirty (30) days; or
(c) terminate the contract as provided herein.

The contractor shall resume performance once a suspension order issued under this section is canceled or expires. If as a result of the suspension of performance, there is a financial or schedule impact upon the contract, an appropriate adjustment may be made by, or with the approval of, the Judicial Purchasing Agent. Any adjustment shall be set forth in writing. After a suspension order has been canceled or expires, the contractor shall provide any request for adjustment to the Judicial Purchasing Agent within thirty (30) days after resuming work performance.

B. Termination of a Contract by the Judiciary

1. Termination for Default or Nonperformance

If, for any reason, the contractor breaches the contract by failing to satisfactorily fulfill or perform any obligations, promises, terms, or conditions, and having been given reasonable notice of and opportunity to cure such default, fails to take satisfactory corrective action within the time specified by the Judiciary, the Judiciary may terminate the contract, in whole or in part, the termination of all outstanding contracts or sub-contracts held by the contractor, and the suspension or debarment of the contractor from future procurements by giving written notice to the contractor specifying the date for termination. The Judiciary shall endeavor to provide such notice at least seven (7) calendar days before the effective date of the termination.

In the event of a termination for default or nonperformance, in whole or in part, the Judiciary may procure similar goods or services in a manner and upon terms it deems appropriate, and the contractor shall be liable for the excess costs incurred by the Judiciary as a result of the contractor's default. The contractor, or its surety, agrees to promptly reimburse the Judiciary for the excess costs, but shall have no claim to the difference should the replacement cost be less.

2. Termination Without Cause

The Judiciary may terminate the contract in whole or in part without cause at any time by giving written notice to the contractor of such termination at least thirty (30) days before the effective date of such termination. The notice shall specify the part(s) of the contract being terminated and the effective termination date.

Within thirty (30) days of the effective date of the termination of the contract the contractor shall compile and submit to the Judiciary an accounting of the work performed up to the date of termination. The Judiciary may consider the following claims in determining reasonable compensation owed to the contractor for work performed up to the date of termination:

(a) contract prices for goods or services accepted under the contract;
(b) costs incurred in preparing to perform and performing the terminated portion of the contract; or
(c) any other reasonable costs incurred by the contractor as a result of the termination.

The total sum to be paid to the contractor shall not exceed the total contract price, less any payments previously made to the contractor, the proceeds from any sales of goods or manufacturing materials, and the contract price for work not terminated.

3. Contractor's Obligations in the Event of Termination

If the contract is terminated for any reason, or expires pursuant to its terms, the contractor shall transfer and deliver to the Judiciary in the manner and to the extent directed by the Judiciary:

(a) all finished or unfinished material prepared by the contractor; and
(b) all material, if any, provided to the contractor by the Judiciary.

For the purposes of the contract, "material" shall include, but is not limited to, goods, supplies, parts, tools, machinery, equipment, furniture, fixtures, information, data, reports, summaries, tables, maps, charts, photographs, studies, recommendations, files, audiotapes, videotapes, records, keys, security badges, and documents.

If the contract is terminated for cause, the contractor shall not be relieved of liability to the Judiciary for damages sustained because of any breach by the contractor. In such event, the Judiciary may retain any amounts which may be due and owing to the contractor until such time as the exact amount of damages due the Judiciary from the contractor has been determined by the Judicial Purchasing Agent. The Judiciary may also set off any damages so determined against the amounts retained.

Upon termination of the contract, the contractor shall stop performance on the date specified, terminate any outstanding orders and subcontracts applicable to the terminated portion of the contract, and shall incur no further commitments or obligations in connection with the terminated performance. The contractor shall settle all liabilities and claims arising out of the termination of subcontracts and order generating from the terminated performance. The Judiciary may direct the contractor to assign the contractor's right, title and interest under terminated orders or subcontracts to the Judiciary or a third party.

Terminations of Purchase Order Contracts or Master Pricing Agreements shall require the signature of the Judicial Purchasing Agent or his designee. Notice of termination by either party shall be submitted in writing to the other party in accordance with the termination clause of the contract, or where no specific termination clause is included, written notice shall be provided no later than thirty (30) days before the expiration of the contract.

Article XV. Presumption of Correctness and Finality of Determinations

Section 15.01 Decision Presumed To Be Correct

The decision of the Judicial Purchasing Committee or any official, agent, or other person designated by the Judiciary concerning any controversy arising under, or in connection with, the solicitation or award of a contract, shall be entitled to a presumption of correctness. The decision

shall not be disturbed unless it was: procured by fraud; in violation of constitutional or statutory provisions; in excess of the statutory authority of the agency; made upon unlawful procedure; affected by other error or law; clearly erroneous in view of the reliable, probative, and substantial evidence on the whole record; arbitrary; capricious; characterized by an abuse of discretion; or clearly unwarranted exercise of discretion.

Section 15.02 Finality of Determinations

The determinations required by Section 10.02(G) (Negotiations After Unsuccessful Competitive Sealed Bidding); Section 10.02(H)(3)(Protest Decision); Section 10.03 (Competitive Negotiations); Section 10.05 (Exceptions); and Article XI (Contractor Prequalification, Qualification and Solicitation) shall be final and conclusive unless they are clearly erroneous, arbitrary, capricious, or contrary to law.

Article XVI. Authority to Resolve Contract and Breach of Contract Controversies

Prior to the institution of arbitration or litigation concerning any contract, claim, or controversy, the Chief Purchasing Officer is authorized, subject to approval of the Judicial Purchasing Committee, to settle, compromise, pay, or otherwise adjust the claim by or against or controversy with, a contractor relating to a contract entered into by the Judiciary, including a claim or controversy based on contract, mistake, misrepresentation, or other cause for contract modification or rescission, but excluding any claim or controversy involving penalties or forfeitures prescribed by statute or regulation where an official other than the Chief Purchasing Officer is specifically authorized to settle or determine such controversy.

Article XVII. Dispute and Appeals Procedure

- Any person, firm, or corporation having a lawfully authorized written contract with the Judiciary may bring an action against the Judiciary on the contract, including, but not limited to actions either for breach of contract, enforcement of contract or for both.
- Any such claim shall be commenced in superior court within three (3) years from the date of completion specified in the contract and shall be tried by the court sitting without a jury. The case shall receive a priority position on the calendar. All defenses in law or equity, except the defense of governmental immunity, shall be preserved to the Judiciary.
- The court shall enter its findings as a judgment of the court and such judgment shall have the same effect and be enforceable as any other judgment of the court in civil cases, subject to the provisions of this chapter.
- Appeals may be taken to the supreme court under the same conditions and under the same practice as appeals are taken from judgments in civil cases rendered by the superior court.
- If damages awarded on any contract claim under this section exceed the original amount of the contract, the excess shall be limited to an amount which is equal to the amount of the original contract.
- No person, firm, or corporation shall be permitted more than one money recovery upon a claim for the enforcement of or for breach of contract with the Judiciary.

The Judiciary shall be immune from any liability that might be incurred as a result of exercising judicial purchasing power, and immune from liability for any and all damages sustained by any person, firm, corporation or entity as a result of good faith determinations made by any member of the Judicial Purchasing Office and/or its designee, in the course of its duties under these rules and regulations.

Article XVIII. Records

The Judiciary shall maintain records of all purchases and sales made under its authority and shall make periodic summary reports of all transactions to the State Court Administrator.

Section 18.01 Report of Noncompetitive Negotiations and Small Purchases

A summary shall be compiled annually by the Judicial Purchasing Agent, within ninety (90) days following the close of the fiscal year, of contracts made under Section 10.05 (Exceptions) during that preceding fiscal year. The summary shall name each contractor; shall state the amount and type of each contract, and shall be retained for a period of five (5) years and available for public inspection.

Article XIX. Grants

"Grants" shall mean monies provided by the Judiciary to or on behalf of individuals or entities to underwrite specific costs of services or programs. Although grants may be distributed for specific purposes, payment is not based upon supply of specific units of service or products.

The Judiciary may obtain services or provide programs on behalf of clients through grants to nonprofit or other entities; however, when the payment of "grant" funds is subject to the provision of services or programs, determination of contract award shall be obtained by a request for proposal procedure to obtain the advantages of competition.

Nonprofit status shall not automatically exempt organizations from being subject to competitive purchasing principles.

The Judiciary may utilize the Department of Administration's Office of Purchases to undertake Request for Proposal procedures; however, Judiciary representatives shall be responsible for assisting in the establishment of evaluation criteria and shall participate in the review and evaluation of responses to the Request for Proposal.

All grant contracts entered into by the Judiciary shall be subject to an audit of competitive practices.

Grants in the form of subsidies or general assistance shall be administered by the Judiciary in accordance with legal mandates restricting or defining the use of such funds.

Section 19.01 Grants Not Considered Procurements

The following grants shall not be considered procurements:

- Grants, subsidies, entitlements or benefits purchased.
- Grants in the form of subsidies or general assistance shall be administered by the Judiciary in accordance with legal mandates restricting or defining the use of such funds.
- Grants, subsidies, entitlements or benefits purchased on behalf of, or paid directly to, individuals. Examples include but shall not be limited to:
    (a) transportation services - public bus, taxicab, ferry;
    (b) education and recreation benefits;
    (c) fees - tuition costs, registration; and
    (d) medical, dental, food stamps, etc.

Section 19.02 Special Provisions and Requirements for Grants

A. Contracting Authority.

Judicial grantor directors may delegate contracting authority to enter into agreements for the purpose of distributing grants. Delegated contracting authority does not require the issuance of a purchase order.

Grants for the provision of programs, services, and facility improvements shall not be authorized without agreements or contracts which:

- specify the purpose for the grant;
- specify method and terms of payment;
- define service or product, if required;
- outline any legal limitations on the funding;
- set a time limit for distribution of funds;
- require maintenance of records for a specified period of time;
- provide for auditing; and
- provide for termination of the agreement/contract.

Article XX. Fixed Asset Management

The Judiciary will provide SFA12 (Report of Fixed Assets) information and follow the fixed asset thresholds for all assets as set forth by the Department of Administration, to be recorded in the State's central fixed asset database. The Judiciary will use inventory tags supplied by the Department of Administration Office of Accounts and Control so as to effectuate the expedient processing of invoices relating to capital purchases.

Article XXI. Effective Date

The rules and regulations contained herein shall become effective when filed with the Secretary of State. They are to be considered a public record and available for public inspection.

Article XXII. Amendment and Suspension of Rules and Regulations

These rules and regulations, or any portion thereof, may be amended or rescinded by the State Court Administrator, with the approval of the Chief Justice, provided notice of the

substance of the proposed amendment is submitted in writing. The amendments, rescissions or suspension of rules shall become effective immediately upon filing with the Secretary of State in the same manner as the original rules.

Submitted by:

J. Joseph Baxter
State Court Administrator

With the approval of :

Frank J. Williams
Chief Justice

Dated:

APPENDIX A

RHODE ISLAND JUDICIARY
GENERAL TERMS AND CONDITIONS OF PURCHASE

Preamble

The Judicial Purchasing Office may, from time to time, make amendments to the General Terms and Conditions when the Judicial Purchasing Agent determines that such amendments are in the best interest of the Judiciary. Amendments shall be made available for public inspection at the Office of the Secretary of State but shall not require formal public notice and hearing. Copies of the Terms and Conditions shall be provided to any individual or firm requesting to become a registered bidder. Applicants shall be required, as part of the application process, to certify that they have read the General Terms and Conditions and understand that they apply to all judicial purchases.

JUDICIAL PURCHASING OFFICE GENERAL CONDITIONS OF PURCHASE

All Judicial purchase orders, contracts, solicitations, delivery orders and service requests shall incorporate and be subject to the provisions of Rhode Island General Laws 8-15-4 and the judicial purchasing rules and regulations adopted pursuant thereto, all other applicable provisions of the Rhode Island General Laws, specific requirements described in the Request or Contract, and the following General Conditions of Purchase:

1. GENERAL

All purchase orders, contracts, solicitations, delivery orders, and service requests are for specified goods and services, in accordance with express terms and conditions of purchase, as defined herein. For the purposes of this document, the terms "bidder" and "contractor" refer to any individual, firm, corporation, or other entity presenting a proposal indicating a desire to enter into contracts with the Judiciary, or with whom a contract is executed by the Judicial Purchasing Agent, and the term "contractor" shall have the same meaning as"vendor".

2. ENTIRE AGREEMENT

The Judiciary's Purchase Order, or other Judiciary contract endorsed by the Judicial Purchasing Office, shall constitute the entire and exclusive agreement between the Judiciary and any contractor receiving an award. In the event any conflict between the bidder's standard terms of sale, these conditions or more specific provisions contained in the solicitation shall govern.

All communication between the Judiciary and any contractor pertaining to any award or contract shall be accomplished in writing.

a. Each proposal will be received with the understanding that the acceptance, in writing, by contract or Purchase Order by the Judicial Purchasing Agent of the offer to do work or to furnish any or all the materials, equipment, supplies or services described therein shall constitute a contract between the bidder and the Judiciary. This shall bind the bidder on his part to furnish and deliver at the prices and in accordance with the conditions of said accepted proposal and detailed specifications and the Judiciary on its part to order from such contractor (except in case of emergency) and to pay for at the agreed prices, all materials, equipment, supplies or services specified and delivered. A contract shall be deemed executory only to the

extent of funds available for payment of the amounts shown on Purchase Orders issued by the Judiciary to the contractors.

b. No alterations or variations of the terms of the contract shall be valid or binding upon the Judiciary unless submitted in writing and accepted by the Judicial Purchasing Agent. All orders and changes thereof must emanate from the Judicial Purchasing Office: no oral agreement or arrangement made by a contractor with an agency or employee will be considered to be binding on the Judicial Purchasing Agent, and may be disregarded.

c. Contracts will remain in force for the contract period specified or until all articles or services ordered before date of termination shall have been satisfactorily delivered or rendered and accepted and thereafter until all terms and conditions have been met, unless:

1. terminated prior to expiration date by satisfactory delivery against orders of entire quantities, or
2. extended upon written authorization of the Judicial Purchasing Agent and accepted by the contractor, to permit ordering of the unordered balances or additional quantities at the contract price and in accordance with the contract terms, or
3. canceled by the Judiciary in accordance with other provisions stated herein.

d. It is mutually understood and agreed that the contractor shall not assign, transfer, convey, sublet or otherwise dispose of this contract or his right, title or interest therein, or his power to execute such contract, to any other person, company or corporation, without the previous consent, in writing, of the Judicial Purchasing Agent.

e. If, subsequent to the submission of an offer or issuance of a purchase order or execution of a contract, the bidder or contractor shall merge with or be acquired by another entity, the contract may be terminated, except as a corporate resolution prepared by the contractor and the new entity ratifying acceptance of the original bid or contract terms, condition, and pricing is submitted to the Judicial Purchasing Office, and expressly accepted.

f. The contractor or bidder further warrants by submission of an offer or acceptance of a purchase order or other contract that he has no knowledge at the time of such action of any outstanding and delinquent or otherwise unsettled debt owed by him to the Judiciary, and agrees that later discovery by the Judicial Purchasing Agent that this warranty was given in spite of such knowledge, except where the matter is pending in hearing or from any appeal therefrom, shall form reasonable grounds for termination of the contract.

3. SUBCONTRACTS

No subcontracts or collateral agreements shall be permitted, except with the Judiciary's express written consent. Upon request, contractors must submit to the Judicial Purchasing Office a list of all subcontractors to be employed in the performance of any Purchase Order or other contract arising from this Request.

4. RELATIONSHIP OF PARTIES

The contractor or bidder warrants, by submission of an offer or acceptance of a purchase order or other contract, that he is not an employee, agent, or servant of the Judiciary, and that he is fully qualified and capable in all material regards to provide the specified goods and services. Nothing herein shall be construed as creating any contractual relationship or obligation between

the Judiciary and any sub-bidder, subcontractor, supplier, or employee of the contractor or offeror.

5. COSTS OF PREPARATION

All costs associated with the preparation, development, or submission of bids or other offers will be borne by the offeror. The Judiciary will not reimburse any offeror for such costs.

6. SPECIFIED QUANTITY REQUIREMENT

Except where expressly specified to the contrary, all solicitations and contracts are predicated on a specified quantity of goods or services, or for a specified level of funding.

a. The Judiciary reserves the right to modify the quantity, scope of service, date of delivery or completion, or funding of any contract, with no penalty or charge, by written notice to the contractor, except where alternate terms have been expressly made a part of the contract.

b. The Judiciary shall not accept quantities in excess of the specified quantity except where the item is normally sold by weight (where sold by weight, the Judiciary will not accept quantities greater than ten per cent [10%] of the specified quantity), or where the Request or Contract provides for awards for other than exact quantities.

c. Purchase Orders or other contracts may be increased in quantity or extended in term without subsequent solicit with the mutual consent of the contractor and the Judiciary, where determined by the Judicial Purchasing Agent to be in the Judiciary's best interest.

7. TERM AND RENEWAL

Where offers have been requested or contracts awarded for terms exceeding periods of twelve (12) months, it is mutually understood and agreed that the Judiciary's commitment is limited to a base term not to exceed twelve (12) months, subject to renewal annually at the Judiciary's sole option for successive terms as otherwise described, except where expressly specified to the contrary. Purchase orders appearing to commit to obligations of funding or terms of performance may be executed for administrative convenience, but are otherwise subject to this provision, and in such cases the Judiciary's renewal shall be deemed to be automatic, conditional on the continued availability of appropriated funds for the purpose, except as written notice of the Judiciary's intent not to renew is served.

8. DELIVERY/COMPLETION

Delivery must be made as ordered and/or projects completed in accordance with the proposal. If delivery qualifications do not appear on the bidder's proposal, it will be interpreted to mean that goods are in stock and that shipment will be made within seven (7) calendar days. If the project completion date is not specified in the proposal, the date shall be determined by the Judicial Purchasing Agent. The decision of the Judicial Purchasing Agent, as to reasonable compliance with the delivery terms, and date of completion shall be final. Burden of proof of delay in receipt of order shall rest with the contractor. No delivery charges shall be added to invoices except when authorized on the Purchase Order.

9. FOREIGN CORPORATIONS

In accordance with Title 7 Chapter 1.1 ("Business Corporations") of the General Laws of Rhode Island, no foreign corporation shall have the right to transact business in this state until it shall have procured a certificate of authority so to do from the Secretary of State.

10. PRICING

All pricing offered or extended to the Judiciary is considered to be firm and fixed unless expressly provided for to the contrary. All prices shall be quoted F.O.B. Destination with freight costs included in the unit cost to be paid by the Judiciary, except, where the Request or Contract permits, offers reflecting F.O.B. Shipping Point will be considered, and freight costs may then be prepaid and added to the invoice.

11. COLLUSION

Bidder or contractor warrants that he has not, directly or indirectly, entered into any agree participated in any collusion or otherwise taken any action in restraint of full competitive bidding. In special circumstances, an executed affidavit will be required as a part of the bid.

12. PROHIBITION AGAINST CONTINGENT FEES AND GRATUITIES

Bidder or contractor warrants that he has not paid, and agrees not to pay, any bonus, commission, fee, or gratuity to any employee or official of the Judiciary for the purpose of obtaining any contract or award issued by the Judiciary. Bidder or contractor further warrants that no commission or other payment has been or will be received from or paid to any third party contingent on the award of any contract by the Judiciary, except as shall have been expressly communicated to the Judicial Purchasing Agent in writing prior to acceptance of the contract or award in question. Subsequent discovery by the Judiciary of non-compliance with these provisions shall constitute sufficient cause for immediate termination of all outstanding contracts and suspension or debarment of the bidder(s) or contractor(s) involved.

13. AWARDS

Awards will be made with reasonable promptness and by written notice to the successful bidder (only); bids are considered to be irrevocable for a period of sixty (60) days following the bid opening unless expressly provided for to the contrary in the Request, and may not be withdrawn during this period without the express permission of the Judicial Purchasing Agent.

a. Awards shall be made to the bidder(s) whose offer(s) constitutes the lowest responsive price offer (or lowest responsive price offer on an evaluated basis) for the item(s) in question or for the Request as a whole, at the option of the Judiciary. The Judiciary reserves the right to determine those offers which are responsive to the Request, or which otherwise serve its best interests.

b. The Judiciary reserves the right, before making award, to initiate investigations as to whether or not the materials, equipment, supplies, qualifications or facilities offered by the bidder meet the requirements set forth in the proposal and specification, and are ample and sufficient to insure the proper performance of the contract in the event of award. If upon such examination it is found that the conditions of the proposal are not complied with or that articles or equipment proposed to be furnished do not meet the requirements called for, or that the qualifications or facilities are not satisfactory, the Judiciary may reject such a bid. It is distinctly understood, however, that nothing in the foregoing shall mean or imply that it is obligatory upon

the Judiciary to make any examinations before awarding a contract; and it is further understood that if such examination is made, it in no way relieves the contractor from fulfilling all requirements and conditions of the contract.

c. Qualified or conditional offers which impose limitations of the bidder's liability or modify the requirements of the bid, offers for alternate specifications, or which are made subject to different terms and conditions than those specified by the Judiciary may, at the option of the Judiciary, be

1. rejected as being non-responsive, or
2. set aside in favor of the Judiciary's terms and conditions (with the consent of the bidder), or
3. accepted, where the Judicial Purchasing Agent determines that such acceptance best serves the interests of the Judiciary.

Acceptance or rejection of alternate or counter-offers by the Judiciary shall not constitute a precedent which shall be considered to be binding on successive solicitations or procurements.

d. Bids submitted in pencil, or which do not bear an original signature, in ink, by an owner or authorized agent thereof, will not be accepted.

e. Bids must be extended in the unit of measure specified in the Request. In the event of any discrepancy between unit prices and their extensions, the unit price will govern.

f. The Judicial Purchasing Agent reserves the right to determine the responsibility of any bidder for a particular procurement.

g. The Judicial Purchasing Agent reserves the right to reject any and all bids in whole or in part, to waive technical defects, irregularities, and omissions, and to give consideration to past performance of the offerors where, in his judgment the best interests of the Judiciary will be served by so doing.

h. The Judicial Purchasing Agent reserves the right to make awards by items, group of items or on the total low bid for all the items specified as indicated in the detailed specification, unless the bidder specifically indicates otherwise in his bid.

i. Preference may be given to bids on products raised or manufactured in the State of Rhode Island, other things being equal.

j. The impact of discounted payment terms shall not be considered in evaluating responses to any Request.

k. The Judicial Purchasing Agent reserves the right to act in the Judiciary's best interests regarding awards caused by clerical errors by the Judicial Purchasing Office.

14. SUSPENSION AND DEBARMENT

The Judicial Purchasing Agent may suspend or debar any vendor or potential bidder, for good cause shown:

a. A debarment or suspension against a part of a corporate entity constitutes debarment or suspension of all of its divisions and all other organizational elements, except where the action has been specifically limited in scope and application, and may include all known corporate affiliates of a contractor, when such offense or act occurred in connection with the affiliate's performance of duties for or on behalf of the contractor, or with the knowledge, approval, or acquiescence of the contractor or one or more of its principals or directors (or where the contractor otherwise participated in, knew of, or had reason to know of the acts).

b. The fraudulent, criminal or other serious improper conduct of any officer, director, shareholder, partner, employee, or any other individual associated with a contractor may be imputed to the contractor when the conduct occurred in connection with the individual's performance of duties for or on behalf of the contractor, or with the contractor's knowledge, approval or acquiescence. The contractor's acceptance of benefits derived from the conduct shall be evidence of such knowledge, approval, or acquiescence.

c. A vendor or contractor who knowingly engages as a subcontractor for a contract awarded by the Judiciary to a vendor or contractor then under a ruling of suspension or debarment by the Judiciary shall be subject to disallowance of cost, annulment or termination of award, issuance of a stop work order, or debarment or suspension, as may be judged to be appropriate by the Judicial Purchasing Agent.

15. PUBLIC RECORDS

Contractors and bidders are advised that certain documents, correspondence, and other submissions to the Judicial Purchasing Office may be voluntarily made public by the Judiciary absent specific notice that portions of such submittals may contain confidential or proprietary information, such that public access to those items should be withheld.

16. PRODUCT EVALUATION

In all specifications, the words "or equal" are understood after each article when manufacturer's name or catalog are referenced. If bidding on items other than those specified, the bidder must, in every instance, give the trade designation of the article, manufacturer's name and detailed specifications of the item the bidder proposes to furnish; otherwise, the bid will be construed as submitted on the identical commodity described in the detailed specifications. The Judicial Purchasing Agent reserves the right to determine whether or not the item submitted is the approved equal the detailed specifications.

a. Any objections to specifications must be filed by a bidder, in writing, with the Judicial Purchasing Agent at least 96 hours before the time of bid opening to enable the Judicial Purchasing Office to properly investigate the objections.

b. All standards are minimum standards except as otherwise provided for in the Request or Contract.

c. Samples must be submitted to the Judicial Purchasing Office in accordance with the terms of the proposals and detailed specifications. Samples must be furnished free of charge and must be accompanied by descriptive memorandum invoices indicating whether or not the bidder desires their return and specifying the address to which they are to be returned (at the bidder's risk and expense), provided they have not been used or made useless by tests; and absent instructions, the samples shall be considered to be abandoned. Award samples may be held for comparison with deliveries.

d. All samples submitted are subject to test by any laboratory the Judicial Purchasing Agent may designate.

17. PRODUCT ACCEPTANCE

All merchandise offered or otherwise provided shall be new, of prime manufacture, and of first quality unless otherwise specified by the Judiciary. The Judiciary reserves the right to reject all nonconforming goods, and to cause their return for credit or replacement, at the

Judiciary's option. Contract deliverables specified for procurements of services shall be construed to be work products, and subject to the provisions of this section.

a. Failure by the Judiciary to discover latent defect(s) or concealed damage or non-conformance shall not foreclose the Judiciary's right to subsequently reject the goods in question.

b. Formal or informal acceptance by the Judiciary of non-conforming goods shall not constitute a precedent for successive receipts or procurements.

c. Where the contractor fails to promptly cure the defect or replace the goods, the Judiciary reserves the right to cancel the Purchase Order, contract with a different contractor, and to invoice the original contractor for any differential in price over the original contract price.

d. When materials, equipment or supplies are rejected, the same must be removed by the contractor from the premises of the Judiciary within forty-eight (48) hours of notification. Rejected items left longer than two days will be regarded as abandoned and the Judiciary shall have the right to dispose of them as its own property.

18. PRODUCT WARRANTIES

All product or service warranties normally offered by the contractor or bidder shall accrue to the Judiciary's benefit, in addition to any special requirements which may be imposed by the Judiciary. Every unit delivered must be guaranteed against faulty material and workmanship for a period of one year unless otherwise specified, and the Judiciary may, in the event of failure, order its replacement, repair, or return for full credit, at its sole option.

19. PAYMENT

Unless otherwise provided for by the Request or Contract, payment shall not be made until delivery has been made, or services performed, in full, and accepted. Payment shall not be due prior to thirty (30) working days following the latest of completion, acceptance, or the rendering of a properly submitted invoice.

a. Payment terms other than the foregoing may be rejected as being nonresponsive.

b. No partial shipments, or partial completion will be accepted, unless provided for by the Request or Contract.

c. Where a question of quality is involved, or failure to complete a project by the specified due date, payment in whole or part against which to charge back any adjustment required, shall be withheld at the direction of the Judicial Purchasing Agent. In the event a cash discount is stipulated, the withholding of payments, as herein described, will not deprive the Judiciary from taking such discount.

d. Payments for used portion of inferior delivery or late delivery will be made by the Judiciary on an adjusted price basis.

e. Payments on contracts under architectural or engineering supervision must be accompanied by a Certificate of Payment and Statement of Account signed by the architect or engineer and submitted to the Judicial Purchasing Office for approval.

20. THIRD PARTY PAYMENTS

The Judiciary recognizes no assigned or collateral rights to any purchase agreement except as may be expressly provided for in the bid or contract documents, and will not accede to any request for third party or joint payment(s), except as provided for in specific orders by a court of competent jurisdiction, or by express written permission of the Judicial Purchasing

Agent. Where an offer is contingent upon such payment(s), the offeror is obligated to serve affirmative notice in his bid submission.

21. SET-OFF AGAINST PAYMENTS

Payments due the contractor may be subject to reduction equal to the amount of unpaid and delinquent state taxes (or other just debt owed to the State), except where notice of delinquency has not been served or while the matter is pending in hearing or from any appeal therefrom.

22. CLAIMS

Any claim against a contractor may be deducted by the Judiciary from any money due him in the same or other transactions. If no deduction is made in such fashion, the contractor shall pay the Judiciary the amount of such claim on demand. Submission of a voucher and payment, thereof, by the Judiciary shall not preclude the Judicial Purchasing Agent from demanding a price adjustment in any case when the commodity delivered is later found to deviate from the specifications and proposal.

a. The Judicial Purchasing Agent may assess dollar damages against a vendor or contractor determined to be non-performing or otherwise in default of their contractual obligations equal to the cost of remedy incurred by the Judiciary, and make payment of such damages a condition for consideration for any subsequent award. Failure by the vendor or contractor to pay such damages shall constitute just cause for disqualification and rejection, suspension, or debarment.

23. CERTIFICATION OF FUNDING

The Chief Purchasing Officer shall provide certification as to the availability of funds to support the procurement for the current fiscal year ending June 30th only. Where delivery or service requirements extend beyond the end of the current fiscal year, such extensions are subject to both the availability of appropriated funds and a determination of continued need.

24. UNUSED BALANCES

Unless otherwise specified, all unused Blanket Order quantities and/or unexpended funds shall be automatically canceled on the expiration of the specified term. Similarly, for orders encompassing more than one fiscal year, unexpended balances of funding allotted for an individual fiscal year may be liquidated at the close of that fiscal year, at the Judiciary's sole option.

25. MINORITY BUSINESS ENTERPRISES

Pursuant to the provisions of Title 37 Chapter 14.1of the General Laws, the Judiciary reserves the right to apply additional consideration to offers, and to direct awards to bidders other than the responsive bid representing the lowest price where:

a. the offer is fully responsive to the terms and conditions of the Request, and

b. the price offer is determined to be within a competitive range (not to exceed 5% higher than the lowest responsive price offer) for the product or service, and

c. the firm making the offer has been certified by the R.I. Department of Economic Development to be a small business concern meeting the criteria established to be considered a Minority Business Enterprise. Ten per cent [10%] of the dollar value of the work performed

against contracts for construction exceeding $5,000 shall be performed by Minority Business Enterprises where it has been determined that subcontract opportunities exist, and where certified Minority Business Enterprises are available. A contractor may count towards its MBE, DBE, or WBE goals 60% of its expenditures for materials and supplies required under a contract and obtained from an MBE, DBE, or WBE regular dealer, and 100% of such expenditures when obtained from an MBE, DBE, or WBE manufacturer. Awards of this type shall be subject to approval, by the Chief Purchasing Officer, of a Subcontracting Plan submitted by the bidder receiving the award.

26. PREVAILING WAGE REQUIREMENT

In accordance with Title 37 Chapter 13 of the General Laws of Rhode Island, payment of the general prevailing rate of per diem wages and the general prevailing rate for regular, overtime and other working conditions existing in the locality for each craft, mechanic, teamster, or type of workman needed to execute this work is a requirement for both contractors and subcontractors for all public works.

27. EQUAL OPPORTUNITY COMPLIANCE, HANDICAPPED ACCESS AND AFFIRMATIVE ACTION

Contractors of the Judiciary are required to demonstrate the same commitment to equal opportunity as prevails under federal contracts controlled by Federal Executive Orders 11246, 11625, 11375 and 11830, and Title 28 Chapter 5.1 of the General Laws of Rhode Island.

Affirmative action plans shall be submitted by the contractor for review by the State Equal Opportunity Office. A contractor's failure to abide by the rules, regulations, contract terms and compliance reporting provisions as established shall be grounds for forfeiture and penalties as shall be established, including but not limited to suspension.

28. DRUG-FREE WORKPLACE REQUIREMENT

Contractors who do business with the Judiciary and their employees shall abide by the State's drug-free workplace policy and the contractor shall so attest by signing a certificate of compliance.

29. TAXES

The Judiciary is exempt from payment of excise, transportation and sales tax imposed by the Federal or State Government. These taxes should not be included in the proposal price. Exemption Certificates will be furnished upon request.

30. INSURANCE

All construction contractors, independent tradesmen, or firms providing any type of maintenance, repair, or other type of service to be performed on judicial premises, buildings, or grounds are required to purchase and maintain coverage with a company or companies licensed to do business in the state as follows:

a. Comprehensive General Liability Insurance
   1) Bodily Injury $1,000,000 each occurrence/ $1,000,000 annual aggregate
   2) Property Damage $500,000 each occurrence /$500,000 annual aggregate

Independent Contractors

Contractual - including construction hold harmless and other types of contracts or agreements in effect for insured operations
Completed Operations
Personal Injury (with employee exclusion deleted)

b. Automobile Liability Insurance
Combined Single Limit $1,000,000 each occurrence
Bodily Injury
Property Damage, and in addition non-owned and/or hired vehicles and equipment

c. Workers' Compensation Insurance
Coverage B $100,000

The Judicial Purchasing Agent reserves the right to consider and accept alternate forms and plans of insurance or to require additional or more extensive coverage for any individual requirement. Successful bidders shall provide certificates of coverage, reflecting the Rhode Island Judiciary as an additional insured, to the Judicial Purchasing Office, forty-eight (48) hours prior to the commencement of work, as a condition of award. Failure to comply with this provision shall result in rejection of the offeror's bid.

31. BID SURETY

When requested, a bidder must furnish a Bid Bond or Certified Check for 5% of his bid, or for the stated amount shown in the solicitation. Bid Bonds must be executed by a reliable Surety Company authorized to do business in the State of Rhode Island. Failure to provide Bid Surety with bid may be cause for rejection of bid. The Bid Surety of any three bidders in contention will be held until an award has been made according to the specifications of each proposal. All others will be returned by mail within 48 hours following the bid opening. Upon award of a contract, the remaining sureties will be returned by mail unless instructed to do otherwise.

32. PERFORMANCE AND LABOR AND PAYMENT BONDS

A performance bond and labor and payment bond of up to 100% of an award may be required by the Judicial Purchasing Agent. Bonds must meet the following requirements:

a. Corporation: The Bond must be signed by an official of the corporation above his/her official title and the corporate seal must be affixed over his/her signature.

b. Firm or Partnership: The Bond must be signed by all of the partners and must indicate that they are "Doing Business As (name of firm)."

c. Individual: The Bond must be signed by the individual owning the business and indicate "Owner."

d. The Surety Company executing the Bond must be licensed to do business in the State of Rhode Island or Bond must be countersigned by a company so licensed.

e. The Bond must be signed by an official of the Surety Company and the corporate seal must be affixed over his signature.

f. Signatures of two witnesses for both the principal and the Surety must appear on the Bond.

g. A Power of Attorney for the official signing of the Bond for the Surety Company must be submitted with the Bond.

33. SUSPENSION, DEFAULT AND TERMINATION

a. Suspension of a Contract by the Judiciary

The Judiciary reserves the right at any time and for any reason to suspend all or part of this contract, for a reasonable period, not to exceed sixty days, unless the parties agree to a longer period. The Judiciary shall provide the contractor with written notice of the suspension order signed by the Purchasing Agent or his or her designee, which shall set forth the date upon which the suspension shall take effect, the date of its expiration, and all applicable instructions. Upon receipt of said order, the contractor shall immediately comply with the order and suspend all work under this contract as specified in the order. The contractor shall take all reasonable steps to mitigate costs and adverse impact to the work specified in the contract during the suspension period. Before the order expires, the Judiciary shall either:

1. cancel the suspension order;
2. extend the suspension order for a specified time period not to exceed thirty (30) days; or
3. terminate the contract as provided herein.

The contractor shall resume performance once a suspension order issued under this section is canceled or expires. If as a result of the suspension of performance, there is a financial or schedule impact upon the contract, an appropriate adjustment may be made by, or with the approval of, the Judicial Purchasing Agent. Any adjustment shall be set forth in writing. After a suspension order has been canceled or expires, the contractor shall provide any request for adjustment to the Judicial Purchasing Agent within thirty (30) days after resuming work performance.

b. Termination of a Contract by the Judiciary

1. Termination for Default or Nonperformance

If, for any reason, the contractor breaches the contract by failing to satisfactorily fulfill or perform any obligations, promises, terms, or conditions, and having been given reasonable notice of and opportunity to cure such default, fails to take satisfactory corrective action within the time specified by the Judiciary, the Judiciary may terminate the contract, in whole or in part, the termination of all outstanding contracts or sub-contracts held by the contractor, and the suspension or debarment of the contractor from future procurements by giving written notice to the contractor specifying the date for termination. The Judiciary shall endeavor to provide such notice at least seven (7) calendar days before the effective date of the termination.

A contractor who fails to commence within the time specified or complete an award made for repairs, alterations, construction, or any other service will be considered in default of contract. If contractor consistently fails to deliver quantities or otherwise perform as specified, the Judicial Purchasing Agent reserves the right to terminate the contract and contract for completion of the work with another contractor and seek recourse from the defaulting contractor or his surety. In the event of a termination for default or nonperformance, in whole or in part, the Judiciary may procure similar goods or services in a manner and upon terms it deems appropriate, and the contractor shall be liable for the excess costs incurred by the Judiciary as a result of the contractor's default. The contractor, or its surety, agrees to promptly reimburse the

Judiciary for the excess costs, but shall have no claim to the difference should the replacement cost be less.

2. Termination Without Cause

The Judiciary may terminate the contract in whole or in part without cause at any time by giving written notice to the contractor of such termination at least thirty (30) days before the effective date of such termination. The notice shall specify the part(s) of the contract being terminated and the effective termination date.

Within thirty (30) days of the effective date of the termination of the contract the contractor shall compile and submit to the Judiciary an accounting of the work performed up to the date of termination. The Judiciary may consider the following claims in determining reasonable compensation owed to the contractor for work performed up to the date of termination:

(a) contract prices for goods or services accepted under the contract;
(b) costs incurred in preparing to perform and performing the terminated portion of the contract; or
(c) any other reasonable costs incurred by the contractor as a result of the termination.

The total sum to be paid to the contractor shall not exceed the total contract price, less any payments previously made to the contractor, the proceeds from any sales of goods or manufacturing materials, and the contract price for work not terminated.

3. Contractor's Obligations in the Event of Termination

If the contract is terminated for any reason, or expires pursuant to its terms, the contractor shall transfer and deliver to the Judiciary in the manner and to the extent directed by the Judiciary:

- all finished or unfinished material prepared by the contractor; and
- all material, if any, provided to the contractor by the Judiciary.

For the purposes of the contract, "material" shall include, but is not limited to, goods, supplies, parts, tools, machinery, equipment, furniture, fixtures, information, data, reports, summaries, tables, maps, charts, photographs, studies, recommendations, files, audiotapes, videotapes, records, keys, security badges, and documents.

If the contract is terminated for cause, the contractor shall not be relieved of liability to the Judiciary for damages sustained because of any breach by the contractor. In such event, the Judiciary may retain any amounts which may be due and owing to the contractor until such time as the exact amount of damages due the Judiciary from the contractor has been determined by the Judicial Purchasing Agent. The Judiciary may also set off any damages so determined against the amounts retained.

Upon termination of the contract, the contractor shall stop performance on the date specified, terminate any outstanding orders and subcontracts applicable to the terminated portion of the contract, and shall incur no further commitments or obligations in connection with the terminated performance. The contractor shall settle all liabilities and claims arising out of the termination of subcontracts and order generating from the terminated performance. The Judiciary may direct the contractor to assign the contractor's right, title and interest under terminated orders or subcontracts to the Judiciary or a third party.

Terminations of Purchase Order Contracts or Master Pricing Agreements shall require the signature of the Judicial Purchasing Agent or his designee. Notice of termination by either party shall be submitted in writing to the other party in accordance with the termination clause of the contract, or where no specific termination clause is included, written notice shall be provided no later than thirty (30) days before the expiration of the contract.

34. INDEMNITY

The contractor guarantees:

a. To save the Judiciary, its agents and employees, harmless from any liability imposed upon the Judiciary arising from the negligence, either active or passive, of the contractor, as well as for the use of any copyrighted or uncopyrighted composition, secret process, patented or unpatented invention, article or appliance furnished or used in the performance of the contract of which the contractor is not the patentee, assignee or licensee.

b. To pay for all permits, licenses and fees and give all notices and comply with all laws, ordinances, rules and regulations of the city or town in which the installation is to be made and of the State of Rhode Island.

c. That the equipment offered is standard new equipment, latest model of regular stock product with all parts regularly used with the type of equipment offered; also, that no attachment or part has been substituted or applied contrary to manufacturer's recommendations and standard practice.

35. CONTRACTOR'S OBLIGATIONS

In addition to the specific requirements of the contract, construction and building repair contractors bear the following standard responsibilities:

a. To furnish adequate protection from damage for all work and to repair damages of any kind, for which he or his workmen are responsible, to the building or equipment, to his own work, or to the work of other contractors;

b. The contractor, its subcontractor(s) and their employees and/or agents, shall protect and preserve property in the contractor or subcontractor's possessions in which the Judiciary has an interest, and any and all materials provided to the contractor or subcontractor by the Judiciary;

c. To clear and remove all debris and rubbish resulting from his work from time to time, as directed or required, a completion of the work leave the premises in a neat unobstructed condition, broom clean, and in satisfactory order and repair;

d. To store equipment, supplies, and material at the site only upon approval by the Judiciary, and at his own risk;

e. To perform all work so as to cause the least inconvenience to the Judiciary, and with proper consideration for the rights of other contractors and workmen;

f. To acquaint themselves with conditions to be found at the site, and to assume responsibility for the appropriate dispatching of equipment and supervision of his employees during the conduct of the work;

g. To ensure that his employees are instructed with respect to special regulations, policies, and procedures in effect for any judicial facility or site, and that they comply with such rules, including but not limited to security policies or practices and/or criminal background checks for any employees and/or subcontractors;

h. The contractor shall ensure that its employees or agents are experienced and fully qualified to engage in the activities and services required under the contract;

i. The contractor shall ensure that at all times while services are being performed under this contract at least one of its employees or agents on the premises has a good command of the English language and can effectively communicate with the Judiciary and its staff;

j. The contractor and contractor's employees or agents shall comply with all applicable licensing and operating requirements required by federal or state law and shall meet accreditation and other generally accepted standards of quality in the applicable field of activity;

k. The contractor shall secure and retain all employee-related insurance coverage for its employees and agents as required by law; and

l. The contractor, subcontractor, and his or her employees and agents shall not disclose any confidential information of the Judiciary to a third party. Confidential information means:

(1) any information of a sensitive or proprietary nature, whether or not specially identified as confidential or proprietary; or

(2) any information about the Judiciary gained during the performance of a contract that is not already lawfully in the public domain.

36. FORCE MAJEURE

All orders shall be filled by the contractor with reasonable promptness, but the contractor shall not be held responsible for any losses resulting if the fulfillment of the terms of the contract shall be delayed or prevented by wars, acts of public enemies, strikes, fires, floods, acts of God, or for any other acts not within the control of the contractor and which by the exercise of reasonable diligence, the contractor is unable to prevent.

FRANK LICHT JUDICIAL COMPLEX
CHILLER PLANT UPGRADES

250 BENEFIT STREET
PROVIDENCE, RHODE ISLAND

MAY 31, 2019

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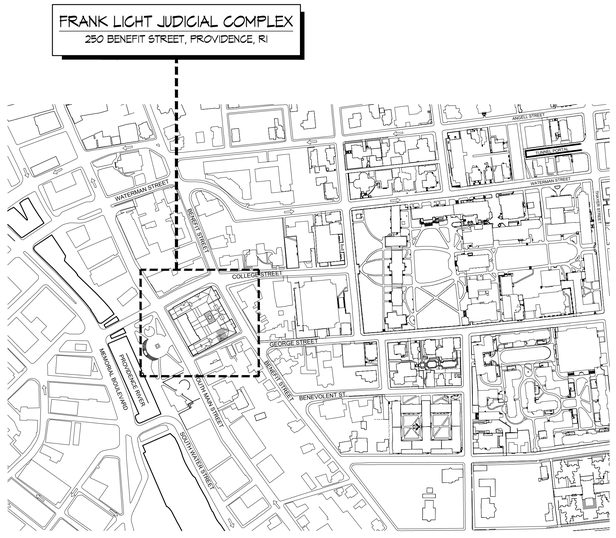

VICINITY MAP
NOT TO SCALE

LIST OF DRAWINGS

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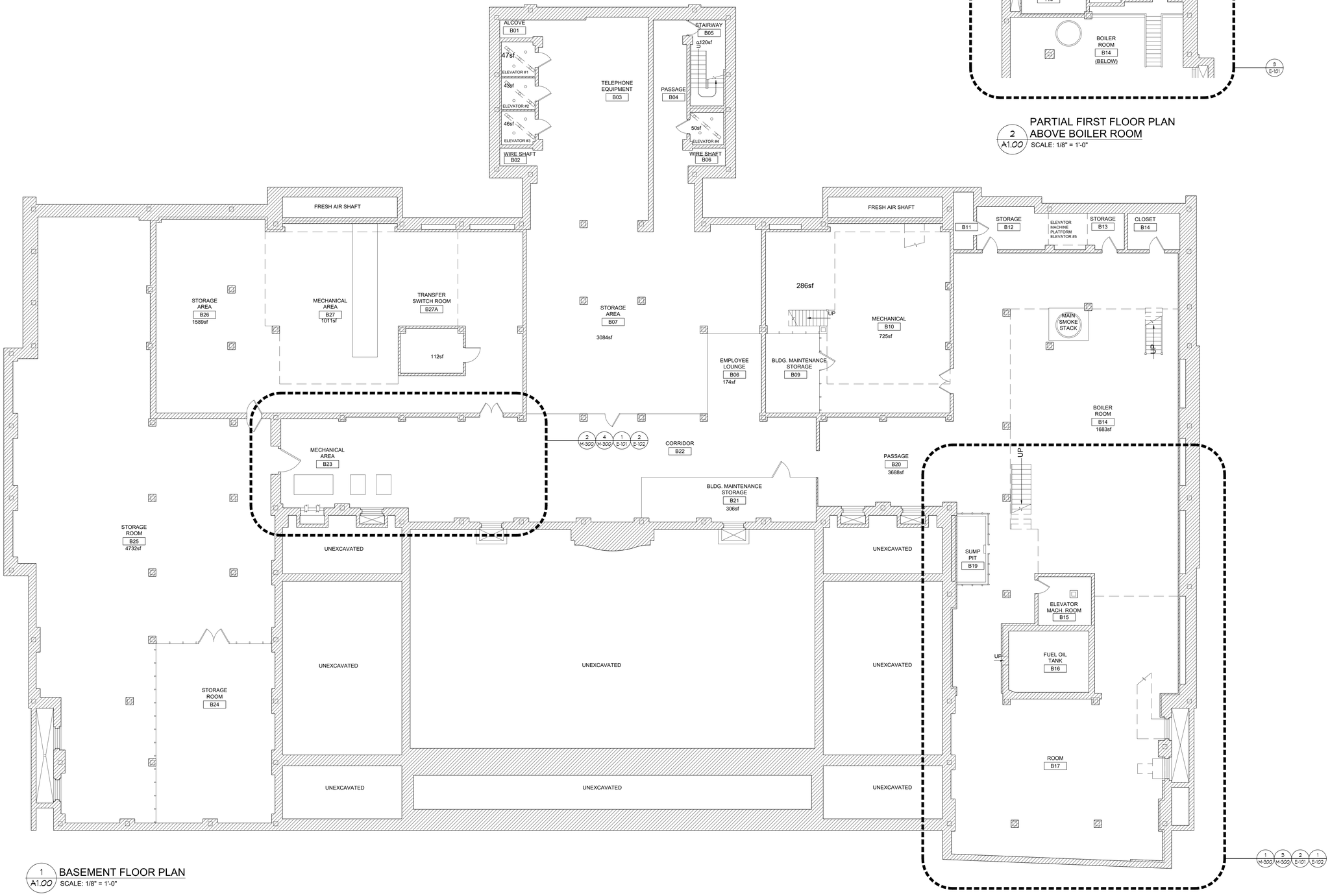
SET NUMBER
MAY 31, 2019



2 A1.00 PARTIAL FIRST FLOOR PLAN ABOVE BOILER ROOM
SCALE: 1/8" = 1'-0"

1 A1.00 BASEMENT FLOOR PLAN
SCALE: 1/8" = 1'-0"

CHILLER PLANT UPGRADES

LICHT JUDICIAL COMPLEX

JUDICIARY — Justice ⚜ Independence ⚜ Honor — RHODE ISLAND

250 BENEFIT STREET
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GENERAL NOTES

1. EXISTING CONDITIONS WERE OBTAINED FROM DRAWINGS AND DATA PROVIDED BY THE OWNER AND A/E FIELD SURVEY. NO WARRANTY OF ACTUAL CONDITIONS IS INTENDED BY ARCHITECT OR OWNER. CONTRACTOR TO VERIFY AND COORDINATE ALL EXISTING CONDITIONS WITH NEW WORK PRIOR TO BID, START OF CONSTRUCTION OR ANY FABRICATION.

2. CONTRACTOR SHALL VISIT SITE, PRIOR TO BID, AND CAREFULLY INVESTIGATE AND EXAMINE THE AREA OF WORK SO AS TO SATISFY HIMSELF AS TO THE NATURE AND LOCATION OF THE WORK, CONTRACTOR TO NOTE THE CHARACTER, QUALITY, QUANTITIES OF MATERIALS REQUIRED AND DIFFICULTIES TO BE ENCOUNTERED, THE KIND AND EXTENT OF EQUIPMENT AND FACILITIES NEEDED FOR PERFORMANCE OF THE WORK AND OTHER ITEMS WHICH MAY, IN ANY WAY, AFFECT THE WORK OR CONTRACTOR'S PERFORMANCE.

3. DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.

4. NO EXITS SHALL BE CLOSED WITHOUT THE WRITTEN PERMISSION OF THE OWNER AND LOCAL AUTHORITIES HAVING JURISDICTION.

5. THE BUILDING WILL BE OCCUPIED DURING ALL OF THE CONSTRUCTION PROCESS. THE CONSTRUCTION SCHEDULE SHALL BE DEVELOPED WITH THE UNDERSTANDING THAT THE BUILDING IS OCCUPIED AND THAT IT CAN NEITHER BE CLOSED NOR CAN THE OWNER'S OPERATIONS STOP.

Date: MAY 31, 2019
Drawn by: EJ Proj. Mgr.: EAR
Revisions

No.	Date	Description

BASEMENT & PARTIAL FIRST FLOOR KEY PLANS

A1.00

19021 - A1.00 | # of #

CHILLED WATER PLANT CONTROL SEQUENCE

GENERAL NOTES:

1. ALL CONTROL SET-POINTS AND ALARMS SHALL BE OPERATOR ADJUSTABLE THRU THE BMS.
2. CHILLERS SHALL BE SUPPLIED WITH THEIR OWN INTEGRAL CONTROL PANEL. THE BMS SUBCONTRACTOR SHALL BE RESPONSIBLE FOR CONNECTING INTO THE CHILLER CONTROL PANEL IN ORDER TO PERFORM THE FOLLOWING CONTROL FUNCTIONS.
   - A. START/STOP - D.O.
   - B. CHILLED WATER SUPPLY-SETPOINT WITH RESET. - A.I.
   - C. GENERAL ALARM - D.I.
   - D. DEMAND LIMIT SIGNAL - A.I.
3. CHWP-1, CHWP-2, CHWP-3, CTP-1, & CTP-2 SHALL HAVE THE FOLLOWING CONTROL POINTS:
   - A. PUMP START/STOP - D.O.
   - B. PUMP STATUS - D.I.
   - C. VFD SPEED - A.O.
4. (CWS), (CWR), (CHWS), AND (CHWR) TEMPERATURES SHALL BE INPUT TO THE BMS AS INDICATED ABOVE
5. THE BMS SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF THE CHILLER DIFFERENTIAL PRESSURE SWITCHES PROVIDED WITH THE CHILLERS. THIS SHALL INCLUDE HARD WIRING TO THE CHILLER CONTROL PANEL.

CHILLER CONTROL

1. THE BMS WILL START AND STOP THE CHILLERS BASED ON CHILLED WATER FLOW. EACH CHILLER SHALL HAVE A FLOW SENSOR ACROSS THE EVAPORATOR BARREL TO CALCULATE FLOW THROUGH EACH CHILLER. THE SUM OF ALL INDIVIDUAL FLOWS SHALL BE CALCULATED BY THE CONTROLLER SOFTWARE AND MADE ACCESSIBLE TO THE OPERATOR.
2. THE SYSTEM OPERATOR MAY OVERRIDE THE LEAD/LAG CHILLER STAGING IN THE WORKSTATION OR KEYPAD/DISPLAY. THE OPERATOR IS ALLOWED TO CHANGE THE LEAD/LAG CHILLER ARRANGEMENT VIA THE OPERATOR WORKSTATION OR KEYPAD/DISPLAY.
3. WHEN ANY CHILLER IS CALLED TO OPERATE, THE ISOLATION VALVES ON THE OPERATOR AND CONDENSER SHALL OPEN. ONCE FLOW IS ESTABLISHED THROUGH THE CHILLER (VERIFIED BY FLOW TRANSMITTERS), THE CHILLER WILL START AND MAINTAIN 45° F SUPPLY CHILLED WATER.
4. WHEN THE CHILLED WATER PLANT IS ENABLED, THE LEAD CHILLER WILL START.
5. THE LEAD CHILLER IS REQUIRED TO OPERATE A MINIMUM OF 30 MINUTES BEFORE THE CONTROL SOFTWARE DECIDES IF ANOTHER CHILLER IS NECESSARY. AFTER THE 30 MINUTE DELAY, THE SECOND STAGE CHILLER SHALL START IF THE TOTAL CALCULATED FLOW IN THE LEAD CHILLER REACHES 95% OR GREATER OF CHILLER CAPACITY FOR 15 MINUTES AND THE CHILLED WATER TEMPERATURE IS 3° F ABOVE SET POINT FOR 15 MINUTES. THE CONTROL SOFTWARE SHALL STAGE OFF THE SECOND STAGE CHILLER OF THE TOTAL CALCULATED GPM FOR BOTH CHILLERS FALLS BELOW 90% CAPACITY OF THE LEAD CHILLER AND CHILLED WATER SUPPLY TEMPERATURE IS BELOW SETPOINT FOR TWENTY MINUTES.
6. THE CRITERIA FOR ADDING OR SUBTRACTING CHILLERS ARE IN SIMILAR MANNER AS THE SECOND STAGE SEQUENCE. STAGING OFF THE CHILLERS SHALL ALWAYS BE IN REVERSE ORDER.
7. SHOULD A CHILLER FAIL TO START A FAULT IS ANNUNCIATED AT THE WORKSTATION AND THE NEXT CHILLER IN SEQUENCE IS CALLED TO OPERATE.
8. PRIOR TO STARTING ANY CHILLERS, THE ISOLATION VALVES SHALL SLOWLY OPEN TO PREVENT ANY LOW FLOW TRIPS ON THE CHILLERS.
9. WHEN THE SECOND CHILLER IS ENABLED, A SIGNAL SHALL BE SENT TO THE DEMAND LIMIT INPUT ON THE FIRST CHILLER TO UNLOAD THE GUIDE VANES. ONCE THE SECOND CHILLER IS ONLINE, THE DEMAND LIMIT SIGNAL SENT FROM THE BMS SHALL BE DISABLED.

CHILLED WATER PLANT CONTROL SEQUENCE

CHILLED WATER PUMP CONTROL

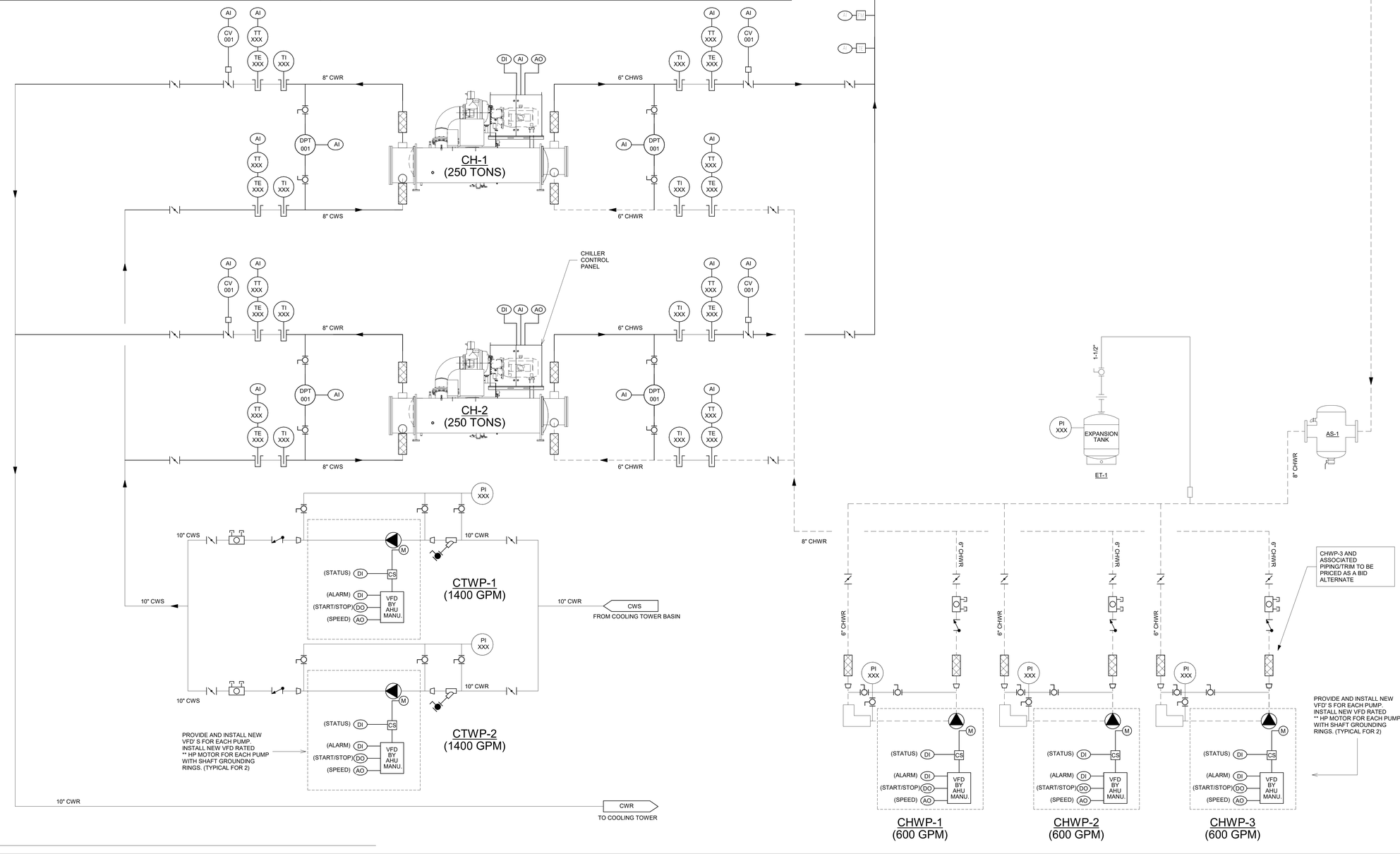
1. THE BMS MAY OVERRIDE THE LEAD/LAG PUMP STAGING IN THE OPERATOR WORKSTATION OR KEYPAD/DISPLAY. THE OPERATOR HAS THE ABILITY TO OVERRIDE ANY PROGRAM FUNCTION (i.e. PUMP START/STOP AND SPEED SETTING).
2. EACH CHILLED WATER PUMP SHALL ROTATE THE "LEAD" ON A WEEKLY BASIS TO EQUALIZE RUNTIME.
3. THE SPEED OF THE CHILLED WATER PUMPS SHALL BE CONTROLLED IN UNISON TO MEET SYSTEM DEMAND.
4. THE FIRST PUMP SHALL OPERATE WHEN THE CHILLER PLANT IS ENABLED. THE PUMP SPEED SHALL BE RESET TO MAINTAIN THE DIFFERENTIAL PRESS. SET POINT MEASURED ACROSS THE DP TRANSMITTERS AT ********** TBD. WHEN THE LEAD CHILLED WATER PUMP HAS BEEN RUNNING ABOVE 95% SPEED FOR 5 MINUTES AND THE LOWEST MEASURED DIFFERENTIAL PRESSURE IS BELOW SET POINT, A SECOND CHILLED WATER PUMP SHALL BE STARTED. THE THIRD CHILLED WATER PUMP SHALL BE STARTED IF ONE OF THE LEAD PUMPS HAS FAILED.
5. MINIMUM ALLOWABLE RATE OF CHANGE OF PUMP SPEED IS 15 MINUTES TO GO FROM 100% TO 50% OF DESIGN FLOW.
6. THE DIFFERENTIAL PRESSURE ACROSS THE EVAPORATOR OF EACH CHILLER DETERMINES THE MINIMUM SPEED OF THE CHILLED PUMPS. THE MINIMUM SPEED OF THE VFDs SHOULD START SO THAT THE DIFFERENTIAL PRESSURE ACROSS THE EVAPORATOR SHOULD NOT FALL BELOW ITS MINIMUM DELTA P VALUE FOR EACH OPERATING CHILLER.
7. SHOULD A PUMP FAIL TO START, A FAULT IS ANNUNCIATED AT THE WORKSTATION AND THE NEXT PUMP IN SEQUENCE IS CALLED TO OPERATE.

CHILLED WATER BYPASS VALVE CONTROL

1. WHEN THE CHILLED WATER PUMP VFD IS OPERATING AT ITS MINIMUM SPEED AND THE DIFFERENTIAL PRESSURE MEASURED AT THE END OF THE LOOP IS ABOVE ITS SETPOINT, THE CHILLED WATER BYPASS VALVE WILL MODULATE OPEN TO MAINTAIN DIFFERENTIAL PRESSURE SETPOINT.

COOLING TOWER PUMP CONTROL

1. THE BMS MAY OVERRIDE THE LEAD/LAG PUMP STAGING IN THE OPERATOR WORKSTATION OR KEYPAD/DISPLAY. THE OPERATOR HAS THE ABILITY TO OVERRIDE ANY PROGRAM FUNCTION (i.e. PUMP START/STOP AND SPEED SETTING).
2. EACH CHILLED WATER PUMP SHALL ROTATE THE "LEAD" ON A WEEKLY BASIS TO EQUALIZE RUNTIME.
3. THE FIRST PUMP SHALL OPERATE WHEN THE CHILLER PLANT IS ENABLED. THE PUMP SPEED SHALL BE RESET TO MAINTAIN THE REQUIRED FLOW THROUGH THE CONDENSER SECTIONS OF THE CHILLER. UPON STARTUP, THE PUMP WILL RAMP TO 50% OF FULL DESIGN FLOW. ONCE FLOW IS ESTABLISHED THE PUMP WILL EITHER RUN AT 50% DESIGN CAPACITY TO SUPPORT A SINGLE ACTIVATED CHILLER, OR RAMP UP TO 100% DESIGN FLOW TO SUPPORT BOTH CHILLERS.



1 CHILLER PLANT FLOW DIAGRAM
12" = 1'-0"

CHILLER PLANT UPGRADES

250 BENEFIT ST. PROVIDENCE, RI 02903

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3. DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
4. NO EXITS SHALL BE CLOSED WITHOUT THE WRITTEN PERMISSION OF THE OWNER AND LOCAL AUTHORITIES HAVING JURISDICTION.
5. THE BUILDING WILL BE OCCUPIED DURING ALL OF THE CONSTRUCTION PROCESS. THE CONSTRUCTION SCHEDULE SHALL BE DEVELOPED WITH THE UNDERSTANDING THAT THE BUILDING IS OCCUPIED AND THAT IT CAN NEITHER BE CLOSED NOR CAN THE OWNER'S OPERATIONS STOP.

TIMOTHY A. ELLIOTT
No. 8148
REGISTERED PROFESSIONAL ENGINEER MECHANICAL
5-31-2019

Date: 5-31-2019
Drawn by: MB **Proj. Mgr.:** TAE

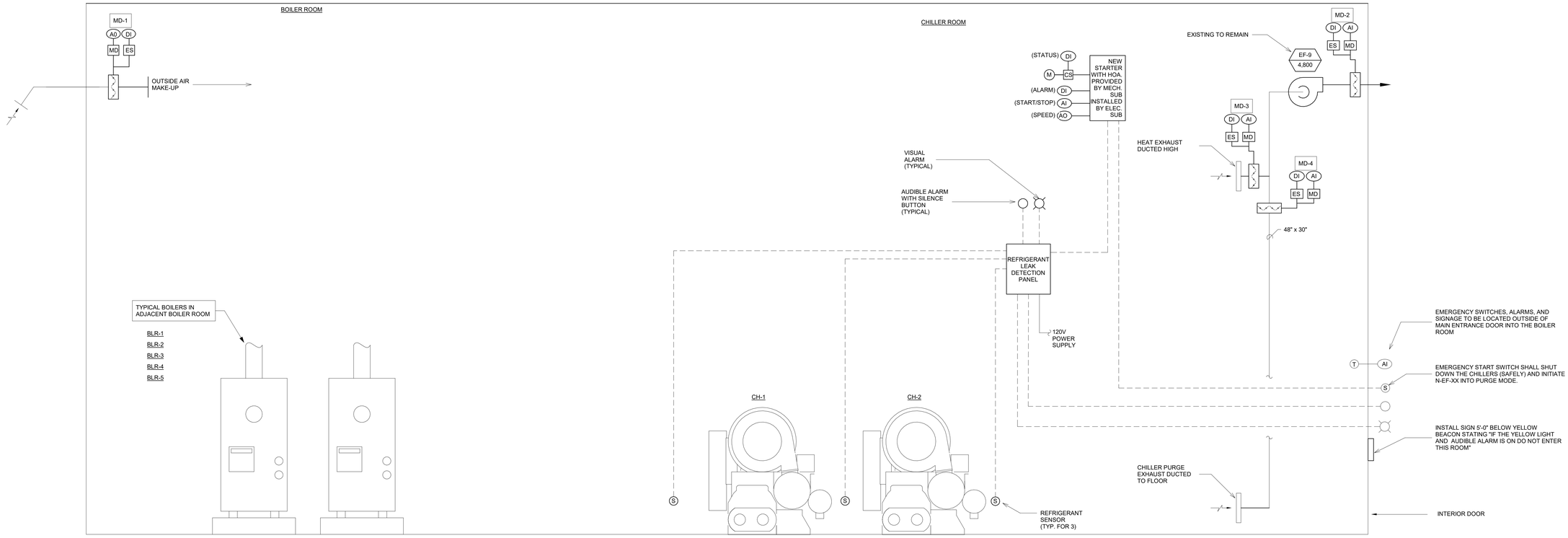
Revisions

No.	Date	Description

CHILLER PLANT FLOW DIAGRAM

M-200

Project - M-200



REFRIGERANT EXHAUST SYSTEM CONTROL SEQUENCE

START/STOP CONTROL

1. REF-1 EXHAUST FAN SHALL BE STARTED OR STOPPED VIA THE LOCAL REFRIGERANT MONITOR SYSTEM PANEL. UPON RECEIVING THE "START" COMMAND, MD-1, MD-2, & MD-4, SHALL BE DRIVEN OPEN AND ONCE THE END SWITCHES ARE MET, EF-9 SHALL BE ENERGIZED. START/STOP MAY OCCUR AS LONG AS ALL SAFETY OR OPERATING CUTOUT SWITCHES ARE CLOSED.
2. UPON RECEIVING A "STOP" COMMAND FROM THE OPERATOR, OR UPON SHUTDOWN BY ANY OPERATING CUTOUT SWITCHES, THE LOCAL REFRIGERANT MONITOR SYSTEM PANEL SHALL DE-ENERGIZE THE EF-9 AND CLOSE MD-1, MD-2, & MD-4.

AIRFLOW

1. EF-9 SHALL OPERATE DURING REFRIGERANT PURGE MODE AS DESCRIBED BELOW.

REFRIGERATION PURGE MODE

1. UPON DETECTION OF REFRIGERANT IN THE SPACE AS SENSED BY THE LOCAL REFRIGERANT MONITOR, MD-1, MD-2, & MD-4, SHALL BE DRIVEN OPEN, AND EF-9 SHALL BE ENERGIZED. A VISUAL AND AUDIBLE ALARM SHALL BE INITIATED
2. UPON DETECTION OF REFRIGERANT IN THE SPACE AS SENSED BY THE LOCAL REFRIGERANT MONITOR, BLR-01, BLR-02, BLR-03, BLR-04, & BLR-05 SHALL BE SHUT DOWN.
3. TWO VISUAL AND THREE AUDIBLE ALARMS SHALL BE PROVIDED AND INSTALLED. ONE VISUAL AND ONE AUDIBLE ALARM SHALL BE INSTALLED IN THE MECHANICAL ROOM, ONE VISUAL AND AUDIBLE ALARM SHALL BE INSTALLED OUTSIDE OF THE MECHANICAL ROOM IN THE MAIN ENTRANCE STAIRWELL. THE VISUAL ALARMS SHALL BE YELLOW BEACON TYPE AND SHALL FLASH WHEN A REFRIGERANT LEAK HAS BEEN DETECTED.

EMERGENCY SHUT DOWN SWITCH

1. AN EMERGENCY EQUIPMENT SHUT DOWN SWITCH SHALL BE INSTALLED OUTSIDE OF THE CHILLER ROOM AS SHOWN IN THE MAIN ENTRANCE STAIRWELL. ONCE THIS BUTTON IS PUSHED THE CHILLER(S) SHALL BE INITIATED INTO THEIR SHUTDOWN MODE. INSTALL IN BREAKABLE GLASS ENCLOSURE

EMERGENCY STOP/START SWITCHES

1. EMERGENCY STOP/START SWITCHES SHALL BE INSTALLED OUTSIDE OF THE CHILLER ROOM AS SHOWN IN THE MAIN ENTRANCE STAIRWELL AND SHALL OPERATE EF-9 IN PURGE MODE AND STOP WHEN MANUALLY PUSHED. INSTALL SWITCHES IN BREAKABLE GLASS ENCLOSURES.

GENERAL EXHAUST SYSTEM CONTROL SEQUENCE

START/STOP CONTROL

1. REF-1 EXHAUST FAN SHALL BE STARTED OR STOPPED VIA THE LOCAL BUILDING MONITOR SYSTEM PANEL. UPON RECEIVING THE "START" COMMAND, MD-1, MD-2, & MD-3, SHALL BE DRIVEN OPEN AND ONCE THE END SWITCHES ARE MET, EF-9 SHALL BE ENERGIZED. START/STOP MAY OCCUR AS LONG AS ALL SAFETY OR OPERATING CUTOUT SWITCHES ARE CLOSED.
2. UPON RECEIVING A "STOP" COMMAND FROM THE OPERATOR, OR UPON SHUTDOWN BY ANY OPERATING CUTOUT SWITCHES, THE LOCAL REFRIGERANT MONITOR SYSTEM PANEL SHALL DE-ENERGIZE THE EF-9 AND CLOSE MD-1, MD-2, & MD-3.

AIRFLOW

1. EF-9 SHALL OPERATE DURING GENERAL EXHAUST MODE AS DESCRIBED BELOW.

EXHAUST MODE

1. UPON EXCEEDING TEMPERATURES IN THE SPACE AS SENSED BY THE LOCAL ROOM THERMOSTAT, MD-1, MD-2, & MD-3, SHALL BE DRIVEN OPEN, AND EF-9 SHALL BE ENERGIZED.

1 REFRIGERANT PURGE
12" = 1'-0"

CHILLER PLANT UPGRADES

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No. 8148
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MECHANICAL
5-31-2019

Date: 5-31-2019
Drawn by: MB **Proj. Mgr.:** TAE

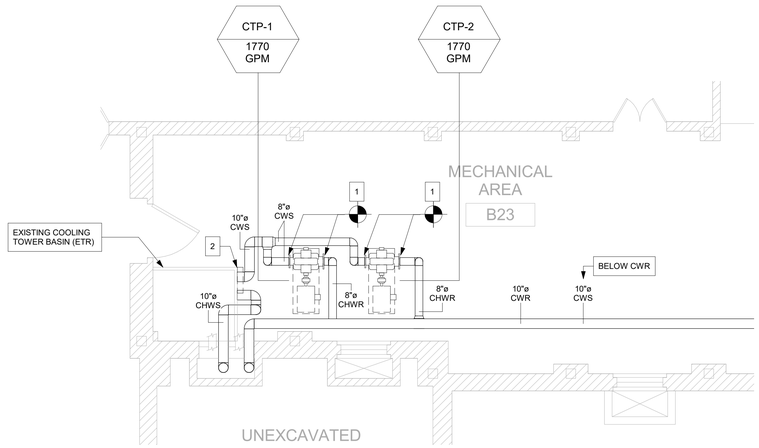
Revisions

No.	Date	Description

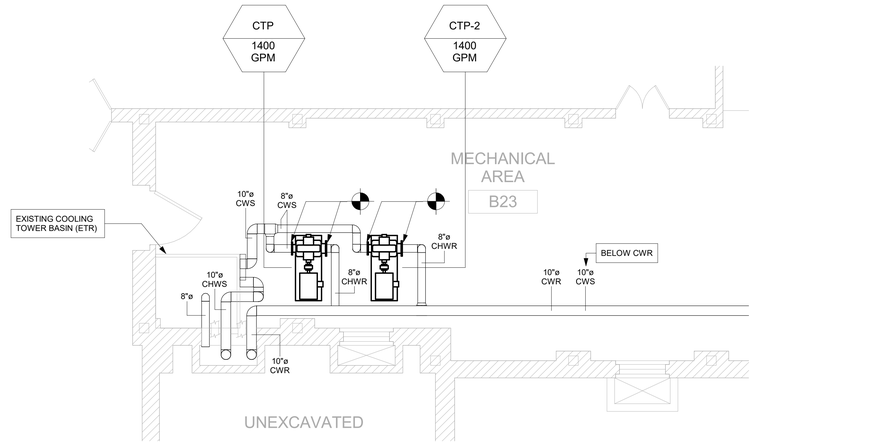
MECHANICAL ROOM
REFRIGERANT PURGE
CONTROL DIAGRAM

M-201

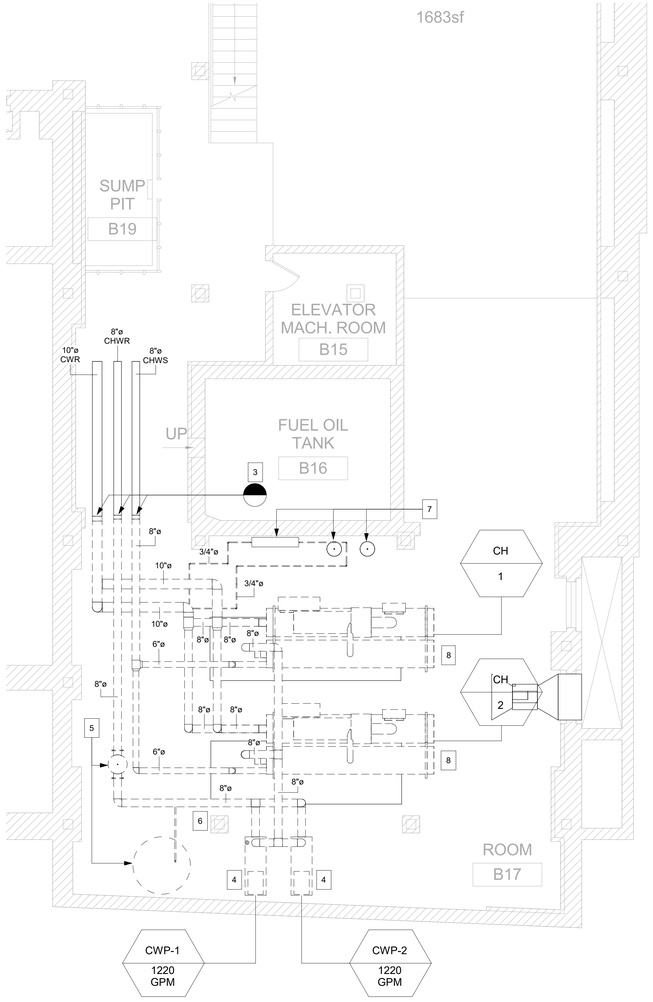
Project - M-201



2 MECH. ROOM DEMO - CONDENSER WATER PUMPS
3/16" = 1'-0"



4 MECH. ROOM NEW WORK - CONDENSER WATER PUMPS
3/16" = 1'-0"



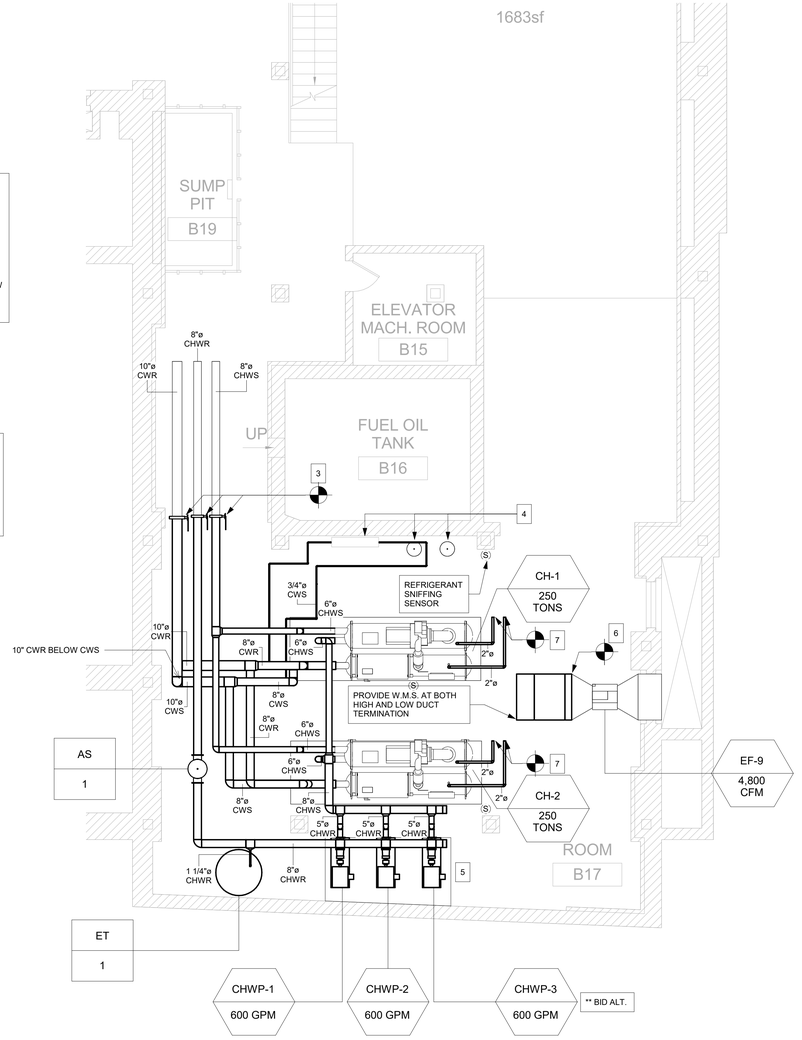
1 MECH. ROOM DEMO - CHILLERS
3/16" = 1'-0"

DEMO WORK NOTES:

1. CLOSE VALVES IN CONDENSER WATER MAINS AND DISCONNECT EXISTING CONDENSER WATER PUMPS. ALL PUMP TRIM TO REMAIN AND BE REUSED FOR NEW CONDENSER WATER PUMP
2. REMOVE EXISTING TOWER LEVEL CONTROLS AT BASIN.
3. CLOSE ISOLATION VALVES IN CONDENSER WATER AND CHILLED WATER MAINS. DISCONNECT CHILLER SIDE PIPING AND DEMO. IF NO VALVES ARE ABLE TO BE UTILIZED, PROVIDE NEW HIGH PERFORMANCE BUTTERFLY ISOLATION VALVES AND CUT INTO SYSTEM WITHOUT DRAINING.
4. REMOVE EXISTING CHILLED WATER PUMPS,PIPING, TRIM, CONTROLS, AND ELECTRICAL CONNECTIONS.
5. REMOVE EXISTING AIR SEPARATOR AND EXPANSION TANK SETUP, INCLUDING ALL ASSOCIATED PIPING AND VALVES.
6. EXISTING MAKEUP WATER STATION TO REMAIN AND BE UTILIZED FOR NEW DESIGN.
7. REMOVE EXISTING WATER QUALITY CONTROL. CHILLED WATER CONNECTION PIPING TO BE DEMO'D AND NEW FINAL CONNECTIONS TO BE MADE DURING NEW WORK.
8. REMOVE EXISTING CHILLERS WITH ALL ASSOCIATED CONTROLS, PIPING, TRIM, AND ELECTRICAL CONNECTIONS.

NEW WORK NOTES:

1. CONNECT NEW CONDENSATE WATER PUMP, CLEAN EXISTING STRAINER, AND OPEN ISOLATION VALVES.
2. CONNECT NEW TOWER LEVEL CONTROLS AT BASIN.
3. CONNECT NEW CHILLED WATER PIPING TO BUTTERFLY ISOLATION VALVES
4. TIE IN NEW CONDENSER WATER CHEMICAL TREATMENT EQUIPMENT INTO NEW CONDENSER WATER PIPING
5. IF CHWP-3 BID ALTERNATE IS INCLUDED, EXISTING CONCRETE PAD TO BE MODIFIED TO FIT ALL (3) CHILLED WATER PUMPS AND BE AT LEAST 6" LARGER THAN PUMP ARRANGEMENT FOOTPRINT ON EVERY SIDE.
6. CONNECT NEW HIGH AND LOW DUCT EXHUAST DUCTWORKT TO EXISTING EF-9.
7. CONNECT NEW CHILLER VENT LINES TO EXISTING VENT RUNOUTS.



3 MECH. ROOM NEW WORK - CHILLERS
3/16" = 1'-0"

CHILLER PLANT UPGRADES

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5-31-2019

Date: 5-31-2019

Drawn by: MB **Proj. Mgr.:** TAE

Revisions

No.	Date	Description

MECH. ROOM DEMO / NEW WORK PART PLANS

M-300

Project - M-300

PUMP SCHEDULE

DESCRIPTION						PUMP DATA							MOTOR DATA						REMARKS
TAG NO.	DESIGN BASIS	MODEL NUMBER	LOCATION	PUMP TYPE	SERVICE	FLOW (GPM)	HEAD (FT.)	PUMP EFFICIENCY	% PROPYLENE GLYCOL	IMPELLER DIAMETER (IN.)	CONNECTION SIZES (SUCT. & DISCH.)	PUMP BASE DIMENSIONS	MOTOR BHP	MINIMUM MOTOR HP	MINIMUM MOTOR EFFICIENCY	PUMP RPM	POWER V-Hz-ø	
CHWP-1	TACO	FI 4013	CHILLER ROOM	BASE MOUNTED END SUCTION	CHILLED WATER SYSTEM	600	150	77	0	12.3	5 x 4	64.00 x 25.18	***	40	***	1760	208-3-60	(1) (2) (3)
CHWP-2	TACO	FI 4013	CHILLER ROOM	BASE MOUNTED END SUCTION	CHILLED WATER SYSTEM	600	150	77	0	12.3	5 x 4	64.00 x 25.18	***	40	***	1760	208-3-60	(1) (2) (3)
CHWP-3	TACO	FI 4013	CHILLER ROOM	BASE MOUNTED END SUCTION	CHILLED WATER SYSTEM	600	150	77	0	12.3	5 x 4	64.00 x 25.18	***	40	***	1760	208-3-60	(1) (2) (3) (4)
CTP-1	TACO	TA2038	CHILLER ROOM	BASE MOUNTED SPLIT CASE	CHILLED WATER SYSTEM	1400	70	82	0	13.3	10 x 8	68.00 x 27.17	***	40	***	1160	208-3-60	(1) (2) (3)
CTP-2	TACO	TA2038	CHILLER ROOM	BASE MOUNTED SPLIT CASE	CHILLED WATER SYSTEM	1400	70	82	0	13.3	10 x 8	68.00 x 27.17	***	40	***	1160	208-3-60	(1) (2) (3)

(1) PROVIDE WITH THE FOLLOWING: (2) OTHER ACCEPTABLE MANUFACTURERS: (3) MOTORS TO BE VFD COMPATIBLE WITH GROUNDING BRUSH. (4) PRICE EQUIPMENT AS BID ALTERNATE

1. PREMIUM EFF. TEFC MOTORS

1. GRUNDFOS
2. BELL AND GOSSETT

WATER COOLED CHILLER SCHEDULE

GENERAL DATA												EVAPORATOR DATA							CONDENSER DATA							ELECTRICAL DATA								
TAG NO.	DESIGN BASIS	MODEL NO.	BUILDING SERVED	AREA LOCATED	DESIGN DUTY	CHILLER TYPE	REFRIGERANT TYPE	REFRIGERANT CHARGE	FULL LOAD EFFICIENCY @ ARI CONDITIONS	IPLV	COMPRESSOR QUANTITY	GPM	EWT (°F)	LWT (°F)	FOULING FACTOR	% PROPYLENE GLYCOL (BY VOLUME)	PRESSURE DROP (FT. WATER)	ARRANGEMENT	GPM	EWT (°F)	LWT (°F)	FOULING FACTOR	% PROPYLENE GLYCOL (BY VOLUME)	PRESSURE DROP (FT. WATER)	ARRANGEMENT	MCA	MOCP	RATED LOAD AMPS (EACH COMP.)	LOCKED ROTOR AMPS (EACH COMP.)	VOLTS	PHASE	HZ	OPERATING WEIGHT (LBS.)	REMARKS
CH-1	YORK	YMC2-S0879AA	LICHT	MECH. ROOM	250 TONS	SCROLL	R134A	553 LBS	***	***	6	598.1	54	44	0.0001	0	16.1	2 PASS	700.5	83	93	0.00025	0	13.1	2 PASS	228	400	***	***	460	3	60	***	(1)
CH-2	YORK	YMC2-S0879AA	LICHT	MECH. ROOM	250 TONS	SCROLL	R134A	553 LBS	***	***	6	598.1	54	44	0.0001	0	16.1	2 PASS	700.5	83	93	0.00025	0	13.1	2 PASS	228	400	***	***	460	3	60	***	(1)

(1) REFER TO SPECIFICATIONS 55587-236800 FOR ADDITIONAL REQUIREMENTS

AIR SEPERATOR SCHEDULE

DESCRIPTION					PERFORMANCE			REMARKS
TAG NO.	DESIGN BASIS	MODEL NUMBER	LOCATION	SERVICE	FLOW (GPM)	MAX. WORKING PRESS. (PSIG)	MAX. OPERATING TEMP. (°F)	
AS-1	SPIROVENT	VSR-1000	MECH. ROOM	CHILLED WATER SYSTEM	1470	150	270	(1) (2)

(1) PROVIDE WITH THE FOLLOWING: (2) OTHER ACCEPTABLE MANUFACTURERS:

1.

1. TACO
2. BELL AND GOSSETT

EXPANSION TANK SCHEDULE

DESCRIPTION						PERFORMANCE		REMARKS
TAG NO.	DESIGN BASIS	MODEL NUMBER	LOCATION	TANK VOLUME (GAL)	SERVICE	MAX. WORKING PRESS. (PSIG)	MAX. OPERATING TEMP. (°F)	
ET-1	TACO	CA-1600	MECH. ROOM	422	CHILLED WATER SYSTEM	150	240	(1) (2)

(1) PROVIDE WITH THE FOLLOWING: (2) OTHER ACCEPTABLE MANUFACTURERS:

1.

1. TACO
2. BELL AND GOSSETT

CHILLER PLANT UPGRADES

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3. DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.

4. NO EXITS SHALL BE CLOSED WITHOUT THE WRITTEN PERMISSION OF THE OWNER AND LOCAL AUTHORITIES HAVING JURISDICTION.

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TIMOTHY A. ELLIOTT
No. 8148
REGISTERED
PROFESSIONAL ENGINEER
MECHANICAL
5-31-2019

Date: 5-31-2019

Drawn by: MB **Proj. Mgr.:** TAE

Revisions

No.	Date	Description

EQUIPMENT SCHEDULES

M-800

Project - M-800

ELECTRICAL NOTES

GENERAL:

1. ALL ELECTRICAL WORK SHAL BE DONE IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE, ALL STATE AND LOCAL CODES/ORDINANCES, THE AUTHORITY HAVING JURISDICTION, AND MANUFACTURER'S RECOMMENDATIONS.
2. ARRANGE ALL NECESSARY INSPECTIONS AND DELIVER ALL REQUIRED INSPECTION CERTIFICATES TO THE OWNER.
3. THE DRAWINGS SHOW THE GENERAL LAYOUT AND TYPICAL DETAILS. PROVIDE COMPLETE SYSTEMS. DRAWINGS ARE BASED ON THE SPECIFIED EQUIPMENT.
4. IF MATERIAL OR EQUIPMENT IS INSTALLED BEFORE IT IS APPROVED, OR IF IN THE OPINION OF THE ARCHITECT OR ENGINEER, THE MATERIAL OR EQUIPMENT DOES NOT MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS THE CONTRACTOR SHALL BE LIABLE FOR ITS REMOVAL AND REPLACEMENT AT NO ADDITIONAL CHARGE.
5. WHERE A CONFLICT OCCURS BETWEEN THE DRAWINGS, NOTES, AND/OR SPECIFICATIONS, THE MORE STRINGENT, AND/OR LARGER QUANTITY AND/OR MORE EXPENSIVE SHALL APPLY. THE REQUIREMENTS LISTED WITHIN NOTES OR SPECIFICATIONS SHALL BE REQUIRED, PROVIDED, AND INSTALLED WHETHER SPECIFICALLY INDICATED ON THE DRAWINGS OR NOT.
6. ALL EQUIPMENT SHALL BE UL LISTED.
7. CONTRACTOR SHALL OBTAIN CUT SHEETS, INSTALLATION DATA, AND ROUGH-IN REQUIREMENTS FOR OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT AND COORDINATE ROUGH-IN AND POWER REQUIREMENTS WITH THE OWNER'S REPRESENTATIVE PRIOR TO STARTING ANY ASSOCIATED WORK.
8. SECURE AN EXTRA SET OF ELECTRICAL DRAWINGS TO BE KEPT ON SITE AND MARK, DAILY, THE DRAWINGS IN RED AS THE PROJECT PROGRESSES IN ORDER TO KEEP AN ACCURATE RECORD OF ALL DEVIATIONS BETWEEN THE WORK SHOWN ON THE DRAWINGS AND THE WORK WHICH IS ACTUALLY INSTALLED. THESE MARKED DRAWINGS SHALL REFLECT ANY AND ALL CHANGES AND REVISIONS TO THE ORIGINAL DESIGN WHICH EXISTS IN THE COMPLETED WORK. DELIVER THE MARKED DRAWINGS TO THE <ARCHITECT/ENGINEER> AT PROJECT CLOSE-OUT.

COORDINATION:

1. CONTRACTOR SHALL COORDINATE ELECTRICAL WORK WITH ALL OTHER TRADES TO AVOID INTERFERENCE.
2. DETERMINE INTERFERENCE BEFORE WORK IS FABRICATED OR INSTALLED. THE CONTRACTOR SHALL BE THOROUGHLY FAMILIAR WITH ALL DETAILS OF WORK AND WORKING CONDITIONS AND COORDINATE WORK DURING PRELIMINARY STAGES TO ENSURE ACTUAL ERECTION WILL PROCEED WITHOUT INTERFERENCE. NO REQUESTS FOR ADDITIONAL PAYMENT WILL BE CONSIDERED WHERE REQUEST IS BASED ON INTERFERENCE
3. ELECTRICAL CONTRACTOR TO COORDINATE WITH MECHANICAL, PLUMBING AND OTHER TRADES TO PROVIDE ALL EQUIPMENT ASSOCIATED WITH THEIR RESPECTIVE TRADES WITH NECESSARY WIRING AND CONDUIT INFRASTRUCTURE FOR ALL SENSORS, AND CONTROL SYSTEMS AS REQUIRED.

DEMOLITION & REMOVAL:

1. DEMOLITION DRAWINGS ARE BASED ON EXISTING PLANS AND FIELD INVESTIGATION(S). CONTRACTOR SHOULD VISIT THE EXISTING BUILDING PRIOR TO BID IN ORDER TO BECOME FAMILIAR WITH THE EXISTING CONDITIONS AND TO AVOID CONFLICTS.
2. ALL ITEMS SHOWN DASHED ON DEMOLITION PLANS ARE EXISTING AND SHALL BE REMOVED COMPLETE INCLUDING BOXES, CONDUIT, WIRE, FASTENERS, AND ASSOCIATED APPURTENANCES UON.
3. ALL ITEMS SHOWN SOLID ON DEMOLITION PLANS ARE EXISTING TO REMAIN.
4. EXISTING CIRCUITING TO REMAIN SHALL BE REROUTED OR RECONNECTED, AS REQUIRED, WHERE AFFECTED BY NEW WORK IN ORDER TO MAINTAIN CONTINUITY OF CIRCUIT. IMMEDIATELY RECONNECT OR REESTABLISH SERVICE TO PORTIONS OF CIRCUITS AFFECTING AREAS THAT ARE NOT IN SCOPE OF WORK.
5. EXISTING CIRCUITRY SERVING LIGHTING FIXTURES AND/OR RECEPTACLES FOR A GIVEN AREA SHALL BE REUSED WHERE CONVENIENT TO SERVE THE NEW LAYOUT. PROVIDE CIRCUIT MODIFICATIONS INDICATED OR AS OTHERWISE REQUIRED TO MAINTAIN THE CONTINUITY OF THE EXISTING CIRCUITS THAT REMAIN.
6. EXISTING SWITCHES AND RECEPTACLES INDICATED TO REMAIN OR BE RELOCATED, INCLUDING DEVICE PLATES, SHALL BE REPLACED TO MATCH NEW CONSTRUCTION. WHERE THEY ARE INDICATED AS RELOCATED, EXTEND BRANCH CIRCUIT WIRING TO NEW LOCATION AND PROVIDE NEW DEVICE AND DEVICE PLATE TO MATCH NEW CONSTRUCTION.
7. ALL EXISTING CONDUITS AND WIRING THAT WILL NOT BE REUSED SHALL BE REMOVED WHERE THEY WILL BE EXPOSED UPON COMPLETION OF NEW WORK. EXISTING CONDUIT TO REMAIN CONCEALED IN WALLS SHALL BE ABANDONED. EXISTING CONDUIT TO REMAIN BELOW FLOOR SLAB SHALL BE CUT OFF ONE INCH BELOW ROUGH FLOOR AND GROUTED FLUSH. ALL EXISTING WIRING IN CONDUITS TO BE ABANDONED SHALL BE DISCONNECTED FROM POWER SOURCE AND REMOVED.
8. EXERCISE CARE IN REMOVAL OF DEMOLITION ITEMS. REPAIR, AT NO ADDITIONAL COST TO OWNER, ANY DAMAGE CAUSED TO EXISTING CONSTRUCTION AND/OR EQUIPMENT TO REMAIN.
9. WHERE PRESENT CONSTRUCTION IS DAMAGED IN THE EXECUTION OF THIS CONTRACT, OR WHERE OPENINGS ARE LEFT DUE TO THE REMOVAL OF CONDUITS, EQUIPMENT, OR APPARATUS, THE SAME SHALL BE REPAIRED OR CLOSED TO CORRESPOND IN MATERIAL, QUALITY, SHAPE, AND FINISH (OR SIMILAR), WITH THAT OF ADJOINING CONSTRUCTION, UNLESS OTHERWISE NOTED.
10. REMOVE ALL ELECTRICAL APPURTENANCES (DISCONNECTS, STARTERS, WIRING, CONDUIT, ETC.) ASSOCIATED WITH EQUIPMENT TO BE REMOVED BY OTHERS.
11. ALL CONDUIT REMOVED SHALL BE REMOVED IN ITS ENTIRETY, INCLUDING FITTINGS, MOUNTING DEVICES, BLANK COVER PLATES FOR ALL OPENED OUTLET BOXES CREATED BY THE REMOVAL OF THE EQUIPMENT AND/OR DEVICES. MOUNTING HARDWARE, ETC. PROVIDE CONDUIT PLUGS AND BLANKS FOR ALL OPENINGS CREATED BY THE REMOVAL OF CONDUIT. PROVIDE
12. ALL MATERIALS REMOVED UNDER DEMOLITION, NOT TO BE RELOCATED OR DESIGNATED TO BE TURNED OVER TO THE OWNER, SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED COMPLETELY FROM THE SITE.
13. ALL WORK AND ALL POWER OUTAGES IN THE EXISTING BUILDING SHALL BE SCHEDULED AT TIMES CONVENIENT TO THE OWNER. WHERE EXISTING ELECTRICAL EQUIPMENT WILL RESULT IN OUTAGES IN AREAS NOT TO BE DEMOLISHED, THE CONTRACTOR SHALL COORDINATE IN ADVANCE AND OBTAIN THE APPROVAL OF THE OWNER.
14. NOTIFY THE OWNER PRIOR TO TURNING OFF ANY CIRCUITS. WHERE REMOVAL OF EXISTING ELECTRICAL EQUIPMENT WILL RESULT IN OUTAGES IN AREA NOT TO BE DEMOLISHED, THIS CONTRACTOR SHALL COORDINATE IN ADVANCE AND OBTAIN THE APPROVAL OF THE BUILDINGMANAGER OR OWNER.
15. IF DURING THE COURSE OF CONSTRUCTION IT IS DETERMINED BY THE CONTRACTOR THAT AN EXISTING CIRCUIT BECOMES A SPARE, THE CONTRACTOR SHALL UPDATE THE PANELBOARD DIRECTORY TO INDICATE SUCH.

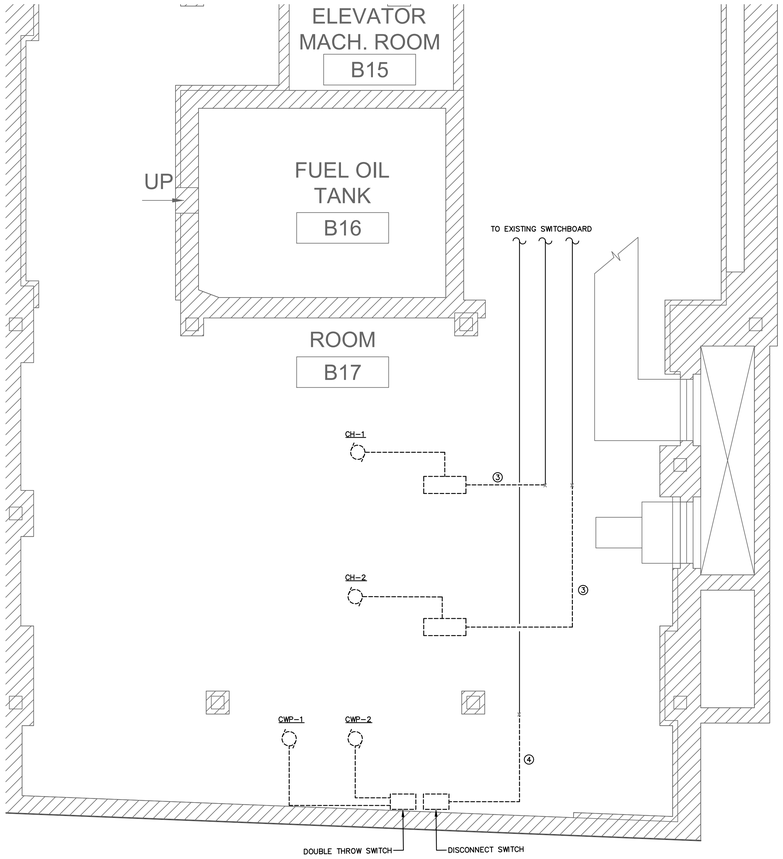
ELECTRICAL LEGEND:

- "XXX" — ELECTRICAL EQUIPMENT TAG – "XXX" DENOTES DESIGNATION – SEE CORRELATING EQUIPMENT SCHEDULE
- (#) — KEY NOTE REFERENCE
- (#) — ONE-LINE DIAGRAM TAG – SEE ONE-LINE DIAGRAM KEY
- XXX-X — MECHANICAL EQUIPMENT TAG – "XXX" DENOTES EQUIPMENT TYPE. "X" DENOTES UNIT NUMBER – REFER TO MECHANICAL EQUIPMENT CONNECTION SCHEDULE
- DISCONNECT SWITCH – SIZE AS INDICATED
- MOTOR STARTER WITH ENCLOSURE
- CB — ENCLOSED CIRCUIT BREAKER – SIZE AS INDICATED
- VFD — VARIABLE FREQUENCY DRIVE
- JB — JUNCTION BOX SIZED PER NEC
- (X) — MOTOR – "X" DENOTES TYPE
  - # = HORSEPOWER RATING
  - F = FRACTIONAL HORSEPOWER MOTOR
  - C = SEALED HERMETIC COMPRESSOR
  - EF = EXHAUST FAN

ABBREVIATIONS

A	AMPERE
ACC	AIR COOLED CONDENSER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CURRENT
AWG	AMERICAN WIRE GAUGE
BFG	BELOW FINISHED GRADE
B	BOILER
C	CONDUIT
CAT	CATALOG
CB	CIRCUIT BREAKER
CH	CHILLER
CU	COPPER
DWG	DRAWING
DS	DISCONNECT SWITCH
EC	ELECTRICAL CONTRACTOR
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
EH	EXHAUST HOOD
EM	EMERGENCY
EQUP	EQUIPMENT
EXST	EXISTING
FLA	FULL LOAD AMPS
G	GROUND
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HP	HORSE POWER
JB	JUNCTION BOX
KCMIL	ONE THOUSAND CIRC. MILS
KW	KILO-WATT
KVA	KILO-VOLT AMPERE
MC	METAL CLAD
MCA	MINIMUM CIRCUIT AMPACITY
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MSB	MAIN SWITCHBOARD
NEC	NATIONAL ELECTRICAL CODE
NF	NON-FUSED
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
Ø	PHASE
P	POLE/PUMP
PH	PHASE
PNL	PANEL
PNLBD	PANELBOARD
PRI	PRIMARY
PT	PRIMARY TRANSFORMER
PVC	POLY VINYL CHLORIDE
SE	SERVICE ENTRANCE
SEC	SECONDARY
SWBD	SWITCHBOARD
TR	TAMPER RESISTANT
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VAC	VOLTS ALTERNATING CURRENT
VAR	VOLT AMPS REACTIVE
VDC	VOLTS DIRECT CURRENT
VFD	VARIABLE FREQUENCY DRIVE
VIF	VERIFY IN FIELD
W	WATTS/WIRE
WP	WEATHERPROOF
XFMR	TRANSFORMER

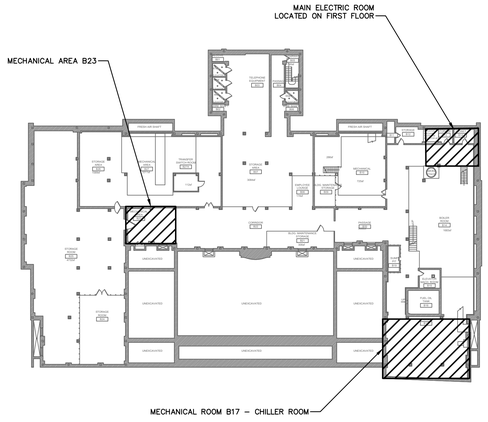
1 MECH. AREA B23 – DEMO
1/4" = 1'-0"



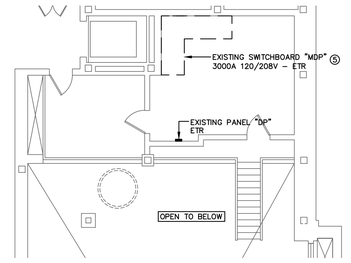
2 MECH. AREA B17 (CHILLER ROOM) – DEMO
1/4" = 1'-0"

KEY SHEET NOTES

1. DISCONNECT (3) #3/0 & (1) #1 GND FROM DISCONNECT SWITCH, SAVE FOR CONDUCTORS FOR REUSE. DEMO DOUBLE THROW & SAFETY SWITCHES. DEMO 2"C TO TO LOCATION SUITABLE FOR PULLBOX.
2. DEMO FEEDERS & CONDUIT TO MOTORS.
3. DISCONNECT CHILLER FEEDERS – (2) 3"C EACH W/ (3) #500 KCMIL & (1) #1/0 GND – SAVE FOR REUSE. DEMO CONDUIT TO LOCATION SUITABLE FOR PULLBOX.
4. DISCONNECT PUMP FEEDER, (1) 2.5"C W/ (3) #250 KCMIL & (1) #3 GND, SAVE FOR REUSE. DEMO CONDUIT TO A LOCATION SUITABLE FOR PULLBOX. DEMO DOUBLE THROW & SAFETY SWITCHES.
5. REMOVE EXISTING FUSES AND PROVIDE NEW DUAL ELEMENT TIME DELAY FUSES AS FOLLOWS:
   - 5.1. (3) 250A IN 400A BUCKET MARKED "CWP"
   - 5.2. (3) 800A IN 800A BUCKET MARKED "CH-1"
   - 5.3. (3) 800A IN 800A BUCKET MARKED "CH-2"
   - 5.4. (3) 200A IN 200A BUCKET MARKDE "CT-1"



4 OVERALL FLOOR PLAN – BASEMENT
1/16" = 1'-0"



3 OVERALL FLOOR PLAN – BASEMENT
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CHILLER PLANT UPGRADES

LICHT JUDICIAL COMPLEX

JUDICIARY — Justice Independence Honor — RHODE ISLAND

250 BENEFIT STREET
PROVIDENCE, RHODE ISLAND

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KEVIN M. SULLIVAN — No. 9948 — REGISTERED PROFESSIONAL ENGINEER — ELECTRICAL

Date: 08.01.2019
Drawn by: CW Proj. Mgr.: KS

Revisions

No.	Date	Description

ELECTRICAL NOTES, LEGEND, ABBREVIATIONS & DEMO FLOOR PLANS

E-101

20190232A10

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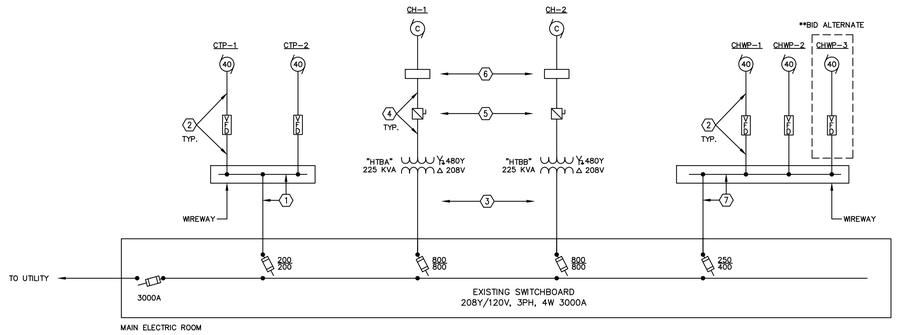


3 ONE-LINE DIAGRAM
NO SCALE

ⓕ ONE-LINE DIAGRAM KEY

TAG	EQUIPMENT DESCRIPTION	REMARKS
1	(1) 2"C W/ (3) #3/0, (1) #6 GND	EXISTING-EXTEND CONDUIT & FEEDERS
2	(1) 1.5"C W/ (3) #1/0, (1) #6 GND	TAPS SHALL BE LESS THAN 10'
3	(2) 3"C EACH W/ (3) 500 KCMIL, (1) 1/0 AWG GND	EXISTING-EXTEND CONDUIT & FEEDERS
4	(1) 3"C W/ (3) 600 KCMIL, (1) 1/0 AWG GND	NEW FEEDERS
5	HEAVY DUTY, 600V, 400A, 3P, FUSED SWITCH	400A D.E.T.D. FUSES
6	CHILLER CONTROLLER	SINGLE POINT CONNECTION
7	2.5"C W/ (3) #250, (1) #6 GND	EXISTING

DRY TYPE TRANSFORMER SCHEDULE

ITEM NO.	EQUIPMENT TAG	KVA	PRIMARY VOLTS	PH	AMPS	OCPD	PRIMARY CONDUCTORS	SECONDARY VOLTS	PH	AMPS	SECONDARY CONDUCTORS	BONDING SBJ	BONDING GEC	REMARKS
1	HTBA	225	208	3	625	800	SEE ONE-LINE DIAGRAM	480	3	270	SEE ONE-LINE DIAGRAM	3/0 AWG	3/0 AWG	①
2	HTBB	225	208	3	625	800	SEE ONE-LINE DIAGRAM	480	3	270	SEE ONE-LINE DIAGRAM	3/0 AWG	3/0 AWG	①

NOTES:
1. EQUIPMENT LAYOUT IS FOR DIAGRAMMATIC PURPOSES ONLY. FIELD VERIFY ELECTRICAL REQUIREMENTS, AND EXACT LOCATIONS W/ OWNER.
2. THE GEC MUST TERMINATE TO A GROUNDING ELECTRODE THAT IS LOCATED AS CLOSE AS PRACTICLE, AND DIRECTLY TO XO. IT SHALL NOT BE TERMINATED TO THE CASE OF THE TRANSFORMER.

ⓕ REMARKS:
1. ALL PROCEEDING REMARKS APPLY.
2. TRANSFORMER TO BE WOUND FOR STEP UP APPLICATION WITH AN IMPEDANCE NO GREATER THAN 6% THE USE OF A STEP DOWN TRANSFORMER IS PROHIBITED.
3. PROVIDE WITH FUSED DISCONNECT SWITCH (600V/400A/3P/400A) ON THE SECONDARY SIDE OF TRANSFORMER.
4. NEUTRAL TO CASE BOND SHALL BE MADE AT THE TRANSFORMER. DO NOT BOND GROUND TO NEUTRAL AT THE DISCONNECT SWITCH.
5. PROVIDE PLACARD INDICATING SOURCE LOCATION AND TYPE AS REQUIRED BY ARTICLE 450 OF THE NEC.
6. PRIMARY CONDUCTORS ARE EXISTING WITH "HIGH PRESS" SPLICES.

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

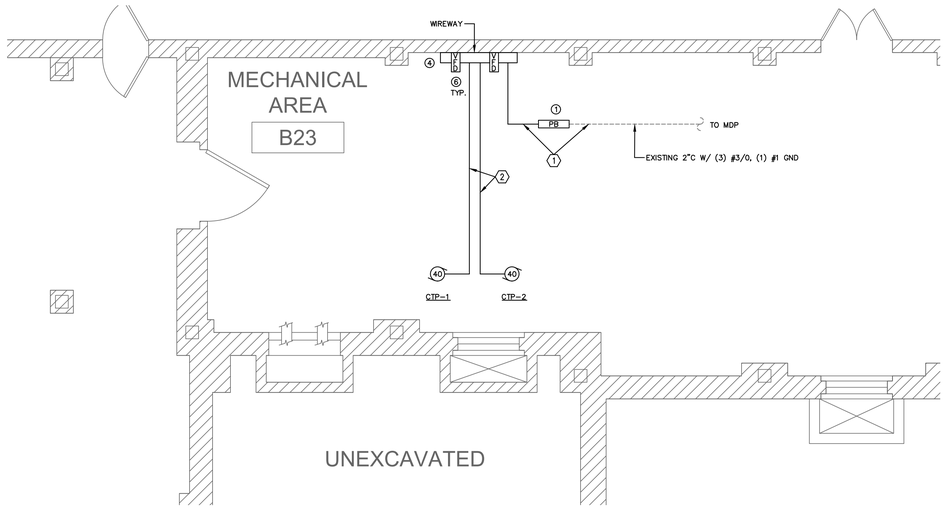
ITEM NO.	EQUIPMENT TAG	LOCATION	EQUIPMENT CHARACTERISTICS VOLTS	PH	HP	FLA	FLC	MCA	MOCP	OCPD I.T.B.	OCPD FUSE	DISTRIBUTION SOURCE	CIRCUIT	CONDUCTORS	STARTER TYPE	STARTER SIZE	STARTER NEMA	DISCONNECT SIZE	DISCONNECT FUSE	DISCONNECT POLE	DISCONNECT NEMA	REMARKS
1	CTP-1	MECHANICAL AREA B23	208	3	40		114				200	MSB		SEE ONE-LINE DIAGRAM	VFD							
2	CTP-2	MECHANICAL AREA B23	208	3	40		114				200	MSB			VFD							
3	CHWP-1	MECHANICAL ROOM B17	208	3	40		114			300		MSB			VFD							③
4	CHWP-2	MECHANICAL ROOM B17	208	3	40		114			300		MSB			VFD							③
5	CHWP-3	MECHANICAL ROOM B17	208	3	40		114			300		MSB			VFD							④
6	CH-1	MECHANICAL ROOM B17	460	3				228	400		400	HTBA			VFD							①③
7	CH-2	MECHANICAL ROOM B17	460	3				228	400		400	HTBB		SEE ONE-LINE DIAGRAM	VFD							①③
8	EF-9	MECHANICAL ROOM B17										EXISTING										②

NOTES:
1. FIELD VERIFY LOCATIONS AND ELECTRICAL REQUIREMENTS.
2. SEE FLOOR PLANS AND ONE LINE DIAGRAM FOR FEEDER CHARACTERISTICS.
3. OCPDs SHALL BE INVERSE TIME BREAKERS OR DUAL ELEMENT TIME DELAY FUSES.
4. FLC IS BASED UPON NEC TABLE 430.250.

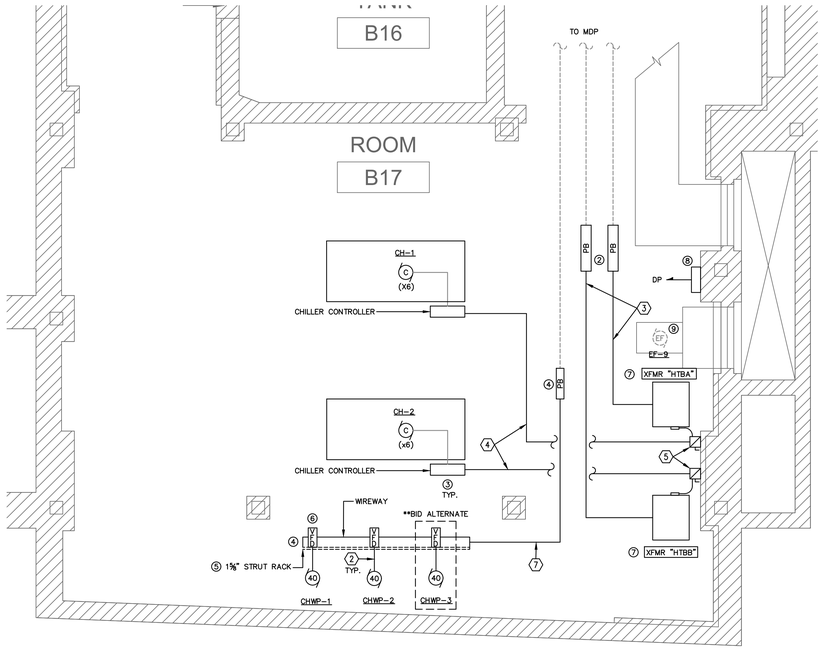
ⓕ REMARKS:
1. SINGLE POINT POWER CONNECTION
2. EXISTING EQUIPMENT, NEW STARTER PROVIDED BY MECHANICAL SUB, INSTALLED BY ELECTRICAL SUB. REUSE EXISTING FEEDERS.
3. SIMULTANEOUS OPERATION WITH LIKE EQUIPMENT AT 50% MAX NAMEPLATE FLC PER VENDOR RECOMMENDATION.
4. BACK-UP TO CHWP-1 & CHWP-2.

ⓕ KEY SHEET NOTES

1. PROVIDE NEW 24"Lx6"Wx8"D WIREWAY. EXTEND EXISTING 2"C, W/ (3) #3/0, (1) #1 GND TO WIREWAY USING "HIGH PRESS" COMPRESSION SPLICES.
2. PROVIDE NEW 36"Lx12"Wx12"D IN-LINE WIREWAY SIZED PER NEC. EXTEND EXISTING 3"C W/ (3) 500 KCMIL, (1) 1/0 AWG GND TO XFMRs "T1" & "T2" USING "HIGH PRESS" COMPRESSION SPLICES.
2. PROVIDE NEW 36"Lx8"Wx8"D IN-LINE WIREWAY SIZED PER NEC. EXTEND EXISTING 2.5"C W/ (3) 250 KCMIL, (1) 6 AWG GND TO WIREWAY USING "HIGH PRESS" COMPRESSION SPLICES.
3. SINGLE POINT CONNECTION, TERMINATE FEEDERS ONTO ENCLOSED CIRCUIT BREAKER.
4. PROVIDE WIREWAY BASED ON NEC TO ACCOMODATE SPLICES AND WIRE BEND RADIUS. SPLICES SHALL BE MADE WITH MULTI-TAP, BLOCK-STYLE, INSULATED, SET SCREW SPLICERS.
5. CONTRACTOR SHALL ERECT A RACK WITH PRE-GALVANIZED 1⅝" STEEL SLOTTED STRUT CHANNEL TO SUPPORT WIREWAY, VFDs & ENCLOSED CBs. RACK SHALL BE LOCATED AS INDICATED SO NOT TO BE PLACED UNDER SIDEWALK.
6. VFDs TO BE PROVIDED BY MECHANICAL CONTRACTORS.
7. SEE DRY-TYPE TRANSFORMER SCHEDULE FOR ELECTRICAL CHARACTERISTICS.
8. REFRIGERANT LEAK DETECTION PANEL. PROVIDE NEW 120V, 20A CIRCUIT FROM PANEL "DP".
9. INSTALL NEW STARTER W/ HOA PROVIDED BY MECH SUB.



2 MECH. AREA B23 (CT PUMPS) – NEW WORK
1/4" = 1'-0"



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CHILLER PLANT UPGRADES

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KEVIN M. SULLIVAN
No. 8948
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL
8/9/2019

Date: 08.01.2019
Drawn by: CW Proj. Mgr.: KS
Revisions

No.	Date	Description

ELECTRICAL SCHEDULES, ONE-LINE DIAGRAM, & NEW WORK FLOOR PLANS

E-102

20190232A10

File Path: J:\DWGS\P2019\0232A\10\MEP\Electrical\20190232.A10_ELE101.dwg Layout: E-102 Plotted: Friday, August 02, 2019 - 1:9 PM User: CWRIGHT
Plotter: NONE CTB File: FO-2536B MONO.CTB