

Project Manual
for
BGS Project #3818
BUILDING AUTOMATION SYSTEM
REPLACEMENT

York County Community College
Wells, ME

September 29, 2026

Prepared for:

York County Community College
Wells, ME

Prepared by:

Richard Grondin, PE
Integrated Energy Systems, PLLC
301 Middle Road
Falmouth, ME 04105
207-781-4263
www.iespllc.com

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Notice to Contractors

Building Automation System Replacement

BGS Project #3818

Replace the building automation system at the York County Community College Classroom Building with an application-specific, configurable control system utilizing an open communication protocol. Work includes removing the existing direct digital control system which serves 18 rooftop units, two air handlers, VAV boxes, reheat coils, fans, boiler system, and exterior lighting; reusing devices and providing new pre-configured controllers and software

The contract shall designate the Substantial Completion Date on or before 21 August 2027, and the Contract Final Completion Date on or before 28 August 2027.

1. Submit bids on a completed Contractor Bid Form (section 00 41 13), provided in the Bid Documents, include bid security when required, and scan each item as an attachment to an email addressed to: BGS.Architect@Maine.gov, so as to be received no later than **1:30:00 p.m.** on 17 November 2026. The email subject line shall be marked "**Bid for BGS Project #3818, Building Automation System Replacement**".

Bid submissions will be opened and read aloud at **2:00 p.m.** on the date noted above at the Bureau of General Services office, accessible as a video conference call. Those who wish to attend the bid opening can access the video conference call by clicking on the "Join Bid Opening" link on the www.maine.gov/dafs/bgs/business-opportunities website.

Any bid received after the noted time will not be considered a valid bid and will remain unopened. Any bid submitted by any other means will not be considered a valid bid. In certain circumstances, the Bureau of General Services may require the Bidder to surrender a valid paper copy of the bid form or the bid security document. The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.

2. Questions and comments on the *bid opening process* shall be addressed to: Division of Planning, Design & Construction, Bureau of General Services, 77 State House Station, Augusta, Maine 04333-0077, BGS.Architect@Maine.gov.
3. Questions and comments regarding the *project* design specifications or drawings shall be directed in writing to the Consultant during the bid period prior to the question and comment deadline of 5:00 p.m. on 9 November 2027.

Integrated Energy Systems, PLLC
Richard Grondin
rgrondin@iespllc.com

00 11 13
Notice to Contractors

4. ☒ Bid security is required on this project.

The Bidder shall include a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with the completed bid form submitted to the Owner. The Bid Bond form is available on the BGS website.

or

- ☐ Bid security is not required on this project.

5. ☒ Performance and Payment Bonds are required on this project.

If noted above as required, or if any combination of Base Bid and Alternate Bids amounts selected in the award of the contract exceeds \$125,000.00, the selected Contractor shall furnish a 100% contract Performance Bond (section 00 61 13.13) and a 100% contract Payment Bond (section 00 61 13.16) in the contract amount to cover the execution of the Work. Bond forms are available on the BGS website.

or

- ☐ Performance and Payment Bonds are not required on this project.

6. Filed Sub-bids *are not required* on this project.

7. ☐ Pre-qualified General Contractors are utilized on this project.

insert the company name, city and state for each

or

- ☒ Pre-qualified General Contractors are not utilized on this project.

8. ☒ An on-site pre-bid conference (☒ *mandatory* or ☐ *optional*) will be conducted for this project.

The pre-bid conference is intended for General Contractors. Subcontractors and suppliers are welcome to attend. Contractors who arrive late or leave early for a mandatory meeting may be prohibited from participating in this meeting and bidding.

2:30pm, 15 October, 2026

Classroom Building, York County Community College, 112 College Drive, Wells, ME

Meeting will begin in main lobby

or

- ☐ An on-site pre-bid conference will not be conducted for this project.

9. Bid Documents - full sets only - will be available on or about *29 September, 2026* and may be obtained *electronically in pdf format at no cost* from:

Integrated Energy Systems, PLLC

301 Middle Road

Falmouth, ME 04105

207-781-4263 rgrondin@iespllc.com

10. Bid Documents may be examined at:

AGC Maine

188 Whitten Road, Augusta, ME 04330

207-622-4741

Construction Summary

734 Chestnut Street, Manchester, NH 03104

603-627-8856

00 21 13
Instructions to Bidders

1. Bidder Requirements

- 1.1 A bidder is a Contractor which is evidently qualified, or has been specifically pre-qualified by the Bureau of General Services, to bid on the proposed project described in the Bid Documents.
- 1.2 Contractors and Subcontractors bidding on projects that utilize Filed Sub-bids shall follow the requirements outlined in these Bid Documents for such projects. See Section 00 22 13 for additional information.
- 1.3 Contractors and Subcontractors are not eligible to bid on the project when their access to project design documents prior to the bid period distribution of documents creates an unfair bidding advantage. Prohibited access includes consultation with the Owner or with design professionals engaged by the Owner regarding cost estimating, constructability review, or project scheduling. This prohibition to bid applies to open, competitive bidding or pre-qualified contractor bidding or Filed Sub-bidding. The Bureau may require additional information to determine if the activities of a Contractor constitute an unfair bidding advantage.
- 1.4 Each bidder is responsible for becoming thoroughly familiar with the Bid Documents prior to submitting a bid. The failure of a bidder to review evident site conditions, to attend available pre-bid conferences, or to receive, examine, or act on addenda to the Bid Documents shall not relieve that bidder from any obligation with respect to their bid or the execution of the work as a Contractor.
- 1.5 Prior to the award of the contract, General Contractor bidders or Filed Sub-bidders may be required to provide documented evidence to the Owner or the Bureau showing compliance with the provisions of this section, their business experience, financial capability, or performance on previous projects.
- 1.6 The selected General Contractor bidder will be required to provide proof of insurance before a contract can be executed.
- 1.7 Contracts developed from this bid shall not be assigned, sublet or transferred without the written consent of the Owner.
- 1.8 By submitting a bid the Contractor attests that it has not been declared ineligible to bid on State of Maine projects. The Director of the Bureau of General Services may disallow award of this contract to any Contractor if there is evidence that the Contractor or any of its Subcontractors, through their own fault, have been terminated, suspended for cause, debarred from bidding, agreed to refrain from bidding as part of a settlement, have defaulted on a contract, or had a contract completed by another party.
- 1.9 The Contractor attests that it is not presently indicted for or otherwise criminally or civilly charged by a Federal, State or local government entity with commission of any of the following offenses and has not within a three-year period preceding this bid been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction, or contract under a public transaction, violation of Federal or State anti-trust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

00 21 13
Instructions to Bidders

- 1.10 The Contractor shall not make any award or permit any award (subgrant or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs or State of Maine projects.
2. Authority of Owner
 - 2.1 The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.
 - 2.2 Subject to the Owner's stated right to accept or reject any or all bids, the Contractor shall be selected on the basis of the lowest dollar value of an acceptable Base Bid, or any combination of Base Bid plus Alternate Bids, as well as other limited cost modifications the Owner determines may best serve the interests of the Owner. An acceptable bid is a duly submitted bid from a responsive and responsible bidder.
 - 2.3 The Owner reserves the right to require Bid Bonds or Performance and Payment Bonds for any project of any contract value.
3. Submitting Bids and Bid Requirements
 - 3.1 Each bid shall be submitted on the forms provided in the Bid Documents.
 - 3.2 Each bid shall be valid for a period of thirty calendar days following the Project bid closing date and time. The bid expiration date may be extended in unusual circumstances by mutual consent of the Bidder and the Owner. The bid amount shall not be modified due to the bid expiration date extension.
 - 3.3 Any provision contained in a bid which shows cost escalation, or any modification of schedule or other requirements shall not be accepted. Such a provision causes the bid to be invalid, or, at the discretion of the Owner and BGS, that element of the bid submission may be disregarded for the purpose of awarding the contract without that provision.
 - 3.4 Bidders shall include a Bid Bond or other approved bid security with the bid form submitted to the Owner when the bid form indicates such bid security is required. The bond value shall be 5% of the bid amount. The form of bond is shown in section 00 43 13.
 - 3.5 Bidders recognize that inclusion of contract bonds and the cost of those bonds is dependent on the awarded contract dollar value. Therefore, a Base Bid, or any combination of Base Bid plus Alternate Bids, as well as other limited cost modifications, resulting in a contract award shall include the cost of Performance and Payment Bonds in the submitted bid amount when the construction contract value is over \$125,000.00. Similarly, the cost of Performance and Payment Bonds is excluded in the submitted bid amount when the construction contract value is \$125,000.00 or less unless bonds are specifically required by the Bid Documents. When required for the project, the selected Contractor shall provide these bonds before a contract can be executed, pursuant to 14 M.R.S.A., Section 871, Public Works Contractors' Surety Bond Law of 1971, subsection 3. The form of bonds is shown in section 00 61 13.13 and 00 61 13.16.

00 21 13
Instructions to Bidders

- 3.6 Bidders may modify bids in writing, by the same means as the original bid submission, prior to the bid closing time. Such written amendments shall not disclose the amount of the initial bid. If so disclosed, the entire bid is considered invalid.
- 3.7 Bidders implicitly acknowledge all Addenda issued when they submit the bid form. By usual practice the Consultant shall not issue Addenda less than 72 hours prior to the bid closing time, to allow ample time for bidders to incorporate the information. However, some information, such as extending the bid due date and time, may be issued with shorter notice. Addenda shall be issued to all companies who are registered holders of Bid Documents.
- 3.8 A bid may be withdrawn without penalty if a written request by the bidder is presented to the Owner prior to the bid closing time. Such written withdrawal requests are subject to verification as required by the Bureau.
- A bid may be withdrawn without penalty after the bid closing time if, in the determination of the Bureau, evidence provided by the Contractor shows an apparent unintended error such as a miscalculation, or an erroneous number on estimating documents, was the cause of an inaccurate bid. The Bureau may allow withdrawal in consideration of the bid bond or, without utilizing a bid bond, if the Bureau considers documented evidence provided by the Contractor shows factual errors had been made on the bid form.
- 3.9 In the event State of Maine Offices unexpectedly close on the published date of a public bid opening in the location of that bid opening, prior to the time of the scheduled deadline, the new deadline for the public bid opening will be the following business day at the originally scheduled hour of the day, at the original location. Official closings are posted on the State of Maine government website.
- 3.10 The Owner may require, in a Notice of Intent to Award letter to the apparent low bidder, a Schedule of Values, Project Schedule, and List of Subcontractors and Suppliers as both a demonstration of capability of the Bidder and as a condition of award.
- 3.11 Projects which require a State of Maine wage determination will include that schedule as part of the Bid Documents. See section 00 73 46, if such rates are required.
- 3.12 Projects which require compliance with the Davis-Bacon Act are subject to the regulations contained the Code for Federal Regulations and the federal wage determination which is made a part of the Bid Documents. See section 00 73 46, if such rates are required.
- 3.13 The Owner is exempt from the payment of Maine State sales and use taxes as provided in 36 M.R.S. §1760 (1). The Contractor and Subcontractors shall not include taxes on exempt items in the construction contract.

00 41 13
Contractor Bid Form

Building Automation System Replacment

BGS Project #3818

Bid Form submitted by: *email only to email address below*

Bid Administrator:

Kristen Haskell, Chief Engineer, Project Manager
Bureau of General Services
111 Sewall Street, Cross State Office Building, 4th floor
77 State House Station
Augusta, Maine 04333-0077

BGS.Architect@Maine.gov

Bidder:

Signature: _____

Printed name and
title: _____

Company name: _____

Mailing address: _____

City, state, zip code: _____

Phone number: _____

Email address: _____

State of
incorporation,
if a corporation: _____

List of all partners,
if a partnership: _____

The Bidder agrees, if the Owner offers to award the contract, to provide any and all bonds and certificates of insurance, as well as Schedule of Values, Project Schedule, and List of Subcontractors and Suppliers if required by the Owner, and to sign the designated Construction Contract within twelve calendar days after the date of notification of such acceptance, except if the twelfth day falls on a State of Maine government holiday or other closure day, or a Saturday, or a Sunday, in which case the aforementioned documents must be received before 12:00 noon on the first available business day following the holiday, other closure day, Saturday, or Sunday.

As a guarantee thereof, the Bidder submits, together with this bid, a bid bond or other acceptable instrument as and if required by the Bid Documents.

00 41 13
Contractor Bid Form

1. The Bidder, having carefully examined the *BGS #3818 Building Automation System Replacement* Project Manual dated *September 29, 2026*, prepared by *Integrated Energy Systems, PLLC* (Consultant), as well as Specifications, Drawings, and any Addenda, the form of contract, and the premises and conditions relating to the work, proposes to furnish all labor, equipment and materials necessary for and reasonably incidental to the construction and completion of this project for the **Base Bid** amount of:

\$ _____ .00

Note: Base Bid includes Allowances and Unit Price Quantities as applicable (see below).

2. Allowances *are not included* on this project.
 <Bid Administrator to select...>

<u>No.</u>	<u>Description</u>	
1	<i>insert brief name of Allowance or "not used"</i>	<u>\$0.00</u>
2	<i>insert brief name of Allowance or "not used"</i>	<u>\$0.00</u>
3	<i>insert brief name of Allowance or "not used"</i>	<u>\$0.00</u>
4	<i>insert brief name of Allowance or "not used"</i>	<u>\$0.00</u>
5	<i>insert brief name of Allowance or "not used"</i>	<u>\$0.00</u>

3. Alternate Bids *are included* on this project.

Alternate Bids are as shown below

Any dollar amount line below that is left blank by the Bidder shall be read as a bid of **\$0.00**.

<u>No.</u>	<u>Description</u>	
1	<i>Alternate Number 1: Additional Control Points</i>	<u>\$0.00</u>
2	<i>insert title of Alternate or "not used"</i>	<u>\$0.00</u>
3	<i>insert title of Alternate or "not used"</i>	<u>\$0.00</u>
4	<i>insert title of Alternate or "not used"</i>	<u>\$0.00</u>
5	<i>insert title of Alternate or "not used"</i>	<u>\$0.00</u>

00 41 13
Contractor Bid Form

4. Unit Prices *are not included* on this project.

No Unit Prices

Any dollar amount line below that is left blank by the Bidder shall be read as a bid of **\$0.00**. *Note: ADD and DEDUCT unit prices cannot differ by more than 20%.*

<u>No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity*</u>	<u>Unit Price ADD</u>	<u>Unit Price DEDUCT</u>
1	<i>insert name of Unit Price Item or "not used"</i>		_____	<u>\$0.00</u>	<u>\$0.00</u>
2	<i>insert name of Unit Price Item or "not used"</i>		_____	<u>\$0.00</u>	<u>\$0.00</u>
3	<i>insert name of Unit Price Item or "not used"</i>		_____	<u>\$0.00</u>	<u>\$0.00</u>
4	<i>insert name of Unit Price Item or "not used"</i>		_____	<u>\$0.00</u>	<u>\$0.00</u>
5	<i>insert name of Unit Price Item or "not used"</i>		_____	<u>\$0.00</u>	<u>\$0.00</u>

* Unit price quantities are included in the **Base Bid** amount above. If installed quantities differ, then cost will be adjusted by Change Order according to the ADD and DEDUCT unit prices as provided above. Quantities shall be verified by the Consultant.

5. Bid security *is required* on this project.

If noted above as required, or if the Base Bid amount exceeds \$125,000.00, the Bidder shall include with this bid form a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with this completed bid form submitted to the Owner.

6. Filed Sub-bids *are not required* on this project.

If noted above as required, the Bidder shall include with this bid form a list of each Filed Sub-bidder selected by the Bidder on the form provided (section 00 41 13F).

00 43 13
Contractor Bid Bond

Bond No.: insert bond number

We, the undersigned, insert company name of Contractor, select type of entity of insert name of municipality in the State of insert name of state as principal, and insert name of surety as Surety, are hereby held and firmly bound unto select title of obligee in the penal sum of five percent of the bid amount, for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns, signed this insert date, i.e.: 8th day of select month, select year, which is the same date as that of the first specified bid due date, or subsequent bid due date revised by addendum.

The condition of the above obligation is such that whereas the principal has submitted to the Owner, or State of Maine, to a certain bid, attached hereto and hereby made a part hereof, to enter into a contract in writing, for the construction of insert name of project as designated in the contract documents

Now therefore:

If said bid shall be rejected, or, in the alternate,

If said bid shall be accepted and the principal shall execute and deliver a contract in the form of contract attached hereto, properly completed in accordance with said bid, and shall furnish a bond for the faithful performance of said contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time within which the Obligee may accept such bid and said Surety does hereby waive notice of any such extension.

00 43 13
Contractor Bid Bond

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this *insert date, i.e.: 8th* day of *select month, select year*, which is the same date as that of the first specified bid due date, or subsequent bid due date revised by addendum.

Contractor

(Signature)

insert name and title

insert company name

insert address
insert city state zip code

Surety

(Signature)

insert name and title

insert company name

insert address
insert city state zip code

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

State of Maine CONSTRUCTION CONTRACT

Large Construction Project

*This form is used when the Contract value is \$50,000 or greater.
The Project Manual, Specifications and Drawings, and any Addenda are considered part of this Contract.*

Agreement entered into by and between the contracting entity name hereinafter called the **Owner** and Contractor company name hereinafter called the **Contractor**.

BGS Project No.: number assigned by BGS

Other Project No.: _____

For the following Project: title of project as shown on bid documents at facility or campus name, municipality, Maine.

The Specifications and the Drawings have been prepared by Consultant firm name, acting as Professional-of-Record and named in the documents as the Consultant Architect or Engineer.

The *Owner* and *Contractor* agree as follows:

ARTICLE 1 COMPENSATION AND PAYMENTS

1.1 The Owner shall pay the Contractor to furnish all labor, equipment, materials and incidentals necessary for the construction of the Work described in the Specifications and shown on the Drawings the Contract Amount as shown below.

Base Bid	<u>\$0.00</u>
<u>Alternate Bid number and name or "no Alternates"</u>	<u>\$0.00</u>
<u>Alternate Bid number and name or "no Alternates"</u>	<u>\$0.00</u>
<u>Alternate Bid number and name or "no Alternates"</u>	<u>\$0.00</u>
<u>Alternate Bid number and name or "no Alternates"</u>	<u>\$0.00</u>
<u>Alternate Bid number and name or "no Alternates"</u>	<u>\$0.00</u>
Total Contract Amount	<u>\$0.00</u>

1.2 The Contractor's requisition shall contain sufficient detail and supporting information for the Owner to evaluate and support the payment requested.

1.2.1 Payments are due and payable twenty-five working days from the date of receipt of a Contractor requisition which is approved by the Owner.

1.2.2 Provisions for late payments are governed by 5 M.R.S. Chapter 144, *Payment of Invoices Received from Business Concerns*, and interest shall be calculated at 1% per month.

ARTICLE 2 COMMENCEMENT AND COMPLETION DATES

2.1 The Work of this Contract shall commence no sooner than the date this document is executed by the approval authority, or a subsequent date designated in the contract documents.

2.2 The Substantial Completion Date shall be _____.

2.3 The Work of this Contract shall be completed on or before the Contract Final Completion Date of _____.

2.4 The Contract Expiration Date shall be _____. (This date is the Owner's deadline for internal management of contract accounts. The Contract Expiration Date does not directly relate to any contract obligation of the Contractor.)

ARTICLE 3 INELIGIBLE BIDDER

3.1 By signing this contract the Contractor attests that it has not been declared ineligible to bid on State of Maine projects. The Bureau of General Services may disallow award of this contract to any Contractor if there is evidence that the Contractor or any of its Subcontractors, through their own fault, have been terminated, suspended for cause, debarred from bidding, agreed to refrain from bidding as part of a settlement, have defaulted on a contract, or had a contract completed by another party.

3.2 By signing this contract the Contractor attests that it is not presently indicted for or otherwise criminally or civilly charged by a Federal, State or local government entity with commission of any of the following offenses and has not within a three-year period preceding this bid been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction, or contract under a public transaction, violation of Federal or State anti-trust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property.

3.3 The Contractor shall not make any award or permit any award (subgrant or contract) at any tier to any party which is debarred or suspended or is otherwise excluded from or ineligible for participation in Federal assistance programs or State of Maine projects.

ARTICLE 4 CONTRACTOR'S RESPONSIBILITIES

4.1 On this project, the Contractor shall furnish the Owner the appropriate contract bonds in the amount of 100% of the Contract Sum. Contract bonds are mandated if the Contract Sum exceeds \$125,000, or if bonds are specifically required by the Contract Documents.

4.2 The Contractor shall comply with all laws, codes and regulations applicable to the Work.

4.3 The Contractor shall acquire all permits and third-party approvals applicable to the Work not specifically identified as provided by the Owner. Costs for Contractor-provided permits and third-party approvals shall be included in the Contract Sum identified in Section 1.1 above.

4.4 The Contractor shall remain an independent agent for the duration of this Contract, shall not become an employee of the State of Maine, and shall assure that no State employee will be compensated by, or otherwise benefit from, this Contract.

4.5 The Contractor shall be responsible for any design cost, construction cost, or other cost incurred on the Project to the extent caused by the negligent acts, errors or omissions of the Contractor or their Subcontractors in the performance of Work under this Contract.

ARTICLE 5 OWNER'S RESPONSIBILITIES

5.1 The Owner shall provide full information about the objectives, schedule, constraints and existing conditions of the project. The Owner has established a budget with reasonable contingencies that meets the project requirements.

5.2 By signing this contract, the Owner attests that all State of Maine procurement requirements for this contract have been met, including the solicitation of competitive bids.

ARTICLE 6 INSTRUMENTS OF SERVICE

6.1 The Contractor's use of the drawings, specifications and other documents known as the Consultant's Instruments of Service is limited to the execution of the Contractor's scope of work of this project unless the Contractor receives the written consent of the Owner and Consultant for use elsewhere.

ARTICLE 7 MISCELLANEOUS PROVISIONS

7.1 This Contract shall be governed by the laws of the State of Maine.

7.2 The Owner and Contractor, respectively, bind themselves, their partners, successors, assigns and legal representatives to this Contract. Neither party to this Contract shall assign the Contract as a whole without written consent of the other party, which consent the Owner may withhold without cause.

7.3 Notwithstanding any other provision of this Agreement, if the Owner does not receive sufficient funds to fund this Agreement or funds are de-appropriated, or if the Owner does not receive legal authority from the Maine State Legislature or Maine Courts to expend funds intended for this Agreement, then the Owner is not obligated to make payment under this Agreement; provided, however, the Owner shall be obligated to pay for services satisfactorily performed prior to any such non-appropriation in accordance with the termination provisions of this Agreement. The Owner shall timely notify the Contractor of any non-appropriation and the effective date of the non-appropriation.

ARTICLE 8 CONTRACT DOCUMENTS

8.1 The Project Manual, Specifications and Drawings, and any Addenda, together with this agreement, form the contract. Each element is as fully a part of the Contract as if hereto attached or herein repeated.

8.2 Specifications: *indicate date of issuance of project manual*

8.3 Drawings: *note here or attach each sheet number and title*

8.4 Addenda: *note each addenda number and date, or "none"*

BGS Project No.: _____

The Contract is effective as of the date executed by the approval authority.

OWNER**CONTRACTOR**

Signature Date
name and title

name of contracting entity
address

telephone
email address

Signature Date
name and title

name of contractor company
address

telephone
email address
Vendor Number

Indicate the names of the review and approval individuals appropriate to the approval authority.

select proper approval authority			
Reviewed by:		Approved by:	
_____ <i>Signature Date</i> <i>insert name</i>		_____ <i>Signature Date</i> <i>John Kenney, P.E.</i>	
<i>Project Manager/ Contract Administrator</i>		<i>Director, Planning Design and Construction Division (PDCD)</i>	

00 61 13.13
Contractor Performance Bond

Bond No.: insert bond number

We, the undersigned, insert company name of Contractor, select type of entity of insert name of municipality in the State of insert name of state as principal, and insert name of surety as Surety, are hereby held and firmly bound unto select title of obligee in the penal sum of the Contract Price \$ insert the Contract Price in numbers for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly and faithfully perform the contract entered into this insert date, i.e.: 8th day of select month, select year, which is the same date as that of the notice of intent to award letter, or in the absence of such a letter, not later than the date the Owner signs the construction contract, for the construction of insert name of project as designated in the contract documents, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

00 61 13.13
Contractor Performance Bond

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this *insert date, i.e.: 8th* day of *select month, select year*, which is the same date as that of the notice of intent to award letter, or in the absence of such a letter, not later than the date the Owner signs the construction contract.

Contractor

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

Surety

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

00 61 13.16
Contractor Payment Bond

Bond No.: insert bond number

We, the undersigned, insert company name of Contractor, select type of entity of insert name of municipality in the State of insert name of state as principal, and insert name of surety as Surety, are hereby held and firmly bound unto select title of obligee in the penal sum of the Contract Price \$ insert the Contract Price in numbers for the use and benefit of claimants, defined as an entity having a contract with the principal or with a subcontractor of the principal for labor, materials, or both labor and materials, used or reasonably required for use in the performance of the contract, for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that if the principal shall promptly satisfy all claims and demands incurred for all labor and materials, used or required by the principal in connection with the work described in the contract entered into this insert date, i.e.: 8th day of select month, select year, which is the same date as that of the notice of intent to award letter, or in the absence of such a letter, not later than the date the Owner signs the construction contract, for the construction of insert name of project as designated in the contract documents, and shall fully reimburse the obligee for all outlay and expense with said obligee may incur in making good any default of said principal, then this obligation shall be null and void.

Otherwise, the same shall remain in force and effect- it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received hereby stipulates and agrees that the obligation of said Surety and its bonds shall be in no way impaired or affected by any extension of the time which the Obligee may accept during the performance of the contract and said Surety does hereby waive notice of any such extension.

00 61 13.16
Contractor Payment Bond

In witness whereof, the principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set above.

Signed and sealed this *insert date, i.e.: 8th* day of *select month, select year*, which is the same date as that of the notice of intent to award letter, or in the absence of such a letter, not later than the date the Owner signs the construction contract.

Contractor

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

Surety

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

If Contractor is a partnership, all partners shall execute the bond. A power of attorney document indicating that it still is in full force and effect shall be provided by the person executing this bond.

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Definitions

1. Definitions

- 1.1 *Addendum*: A document issued by the Consultant that amends the Bid Documents. Addenda shall not be issued less than seventy-two hours prior to the specified bid opening time.
- 1.2 *Allowance*: A specified dollar amount for a particular scope of work or service included in the Work that is identified in the Bid Documents and included in each Bidder's Bid. The Contractor shall document expenditures for an Allowance during the Project. Any unused balance shall be credited to the Owner. The Contractor is responsible for notifying the Owner of anticipated expenses greater than the specified amount and the Owner is responsible for those additional expenses.
- 1.3 *Alternate Bid*: The Contractor's written offer of a specified dollar amount, submitted on the Bid Form, for the performance of a particular scope of work described in the Bid Documents. The Owner determines the low bidder based on the sum of the base Bid and any combination of Alternate Bids that the Owner selects.
- 1.4 *Architect*: A Consultant acting as, or supporting, the Professional-of-Record who is responsible for the design of the Project. Equivalent to "Consultant" in State of Maine contract forms.
- 1.5 *Architectural Supplemental Instruction (ASI)*: A written instruction from the Architect for the purpose of clarification of the Contract Documents. An ASI does not alter the Contract Price or Contract Time. ASIs may be responses to RFIs and shall be issued by the Architect in a timely manner to avoid any negative impact on the Schedule of the Work.
- 1.6 *Bid*: The Contractor's written offer of a specified dollar amount or amounts, submitted on a form included in the Bid Documents, for the performance of the Work. A Bid may include bonds or other requirements. A base Bid is separate and distinct from Alternate Bids, being the only cost component necessary for the award of the contract, and representing the minimum amount of Work that is essential for the functioning of the Project.
- 1.7 *Bid Bond*: The security designated in the Bid Documents, furnished by Bidders as a guaranty of good faith to enter into a contract with the Owner, should a contract be awarded to that Bidder.
- 1.8 *Bidder*: Any business entity, individual or corporation that submits a bid for the performance of the work described in the Bid Documents, acting directly or through a duly authorized representative. See also *Responsive and Responsible Bidder*.
- 1.9 *Bid Documents*: The drawings, procurement and contracting requirements, general requirements, and the written specifications -including all addenda, that a bidder is required to reference in the submission of a bid.
- 1.10 *Bureau*: The State of Maine Bureau of General Services, or BGS, in the Department of Administrative and Financial Services.
- 1.11 *Calendar days*: Consecutive days, as occurring on a calendar, taking into account each day of the week, month, year, and any religious, national or local holidays. Calendar days are used for changes in Contract Time.

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Definitions

- 1.12 *Certificate of Substantial Completion*: A document developed by the Consultant that describes the final status of the Work and establishes the date that the Owner may use the facility for its intended purpose. The Certificate of Substantial Completion may also include a provisional list of items - a "punch list" - remaining to be completed by the Contractor. The Certificate of Substantial Completion identifies the date from which the project warranty period commences.
- 1.13 *Certificate of Occupancy*: A document developed by a local jurisdiction such as the Code Enforcement Officer that grants permission to the Owner to occupy a building.
- 1.14 *Change Order (CO)*: A document that modifies the contract and establishes the basis of a specific adjustment to the Contract Price or the Contract Time, or both. Change Orders may address correction of omissions, errors, and document discrepancies, or additional requirements. Change Orders should include all labor, materials and incidentals required to complete the work described. A Change Order is not valid until signed by the Contractor, Owner and Consultant and approved by the Bureau.
- 1.15 *Change Order Proposal (COP) (see also Proposal)*: Contract change proposed by the Contractor regarding the contract amount, requirements, or time. The Contractor implements the work of a COP after it is accepted by all parties. Accepted COPs are incorporated into the contract by Change Order.
- 1.16 *Clerk of the Works*: The authorized representative of the Consultant on the job site. Clerk of the Works is sometimes called the Architect's representative.
- 1.17 *Construction Change Directive (CCD)*: A written order prepared by the Consultant and signed by the Owner and Consultant, directing a change in the Work prior to final agreement with the Contractor on adjustment, if any, in the Contract Price or Contract Time, or both.
- 1.18 *Contract*: A written agreement between the Owner and the successful bidder which obligates the Contractor to perform the work specified in the Contract Documents and obligates the Owner to compensate the Contractor at the mutually accepted sum, rates or prices.
- 1.19 *Contract Bonds (also known as Payment and Performance Bonds)*: The approved forms of security, furnished by the Contractor and their surety, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials and equipment by the Contractor.
- 1.20 *Contract Documents*: The drawings and written specifications (including all addenda), Standard General Conditions, and the contract (including all Change Orders subsequently incorporated in the documents).
- 1.21 *Contract Expiration Date*: Date determined by the Owner as a deadline for internal management of contract accounts. This allows time after the Contract Final Completion Date for processing the final Requisition for Payment. The Contract Expiration Date does not directly relate to any contract obligation of the Contractor.
- 1.22 *Contract Final Completion Date*: Point of time when the Work is fully completed in compliance with the Contract Documents, as certified by the Consultant. Final payment to the Contractor is due upon Final Completion of the Project.
- 1.23 *Contract Price*: The dollar amount of the construction contract, also called *Contract Sum*.

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Definitions

- 1.24 *Contract Time*: The designated duration of time to execute the Work of the contract, with a specific date for completion.
- 1.25 *Contractor*: Also called the "General Contractor" or "GC" the individual or entity undertaking the execution of the general contract work under the terms of the contract with the Owner, acting directly or through a duly authorized representative. The Contractor is responsible for the means, methods and materials utilized in the execution and completion of the Work.
- 1.26 *Consultant*: The Architect or Engineer acting as Professional-of-Record for the Project. The Consultant is responsible for the design of the Project.
- 1.27 *Drawings*: The graphic and pictorial portion of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
- 1.28 *Engineer*: A Consultant acting as, or supporting, the Professional-of-Record who is responsible for the design of the Project. Equivalent to "Consultant" in State of Maine contract forms.
- 1.29 *Filed Sub-bid*: The designated major Subcontractor's (or, in some cases, Contractor's) written offer of a specified dollar amount or amounts, submitted on a form included in the Bid Documents, for the performance of a particular portion of the Work. A Filed Sub-bid may include bonds or other requirements.
- 1.30 *General Requirements*: The on-site overhead expense items the Contractor provides for the Project, typically including, but not limited to, building permits, construction supervision, Contract Bonds, insurance, field office, temporary utilities, rubbish removal, and site fencing. Overhead expenses of the Contractor's general operation are not included. Sometimes referred to as the Contractor's General Conditions.
- 1.31 *Owner*: The State agency which is represented by duly authorized individuals. The Owner is responsible for defining the scope of the Project and compensation to the Consultant and Contractor.
- 1.32 *Owner's Representative*: The individual or entity contracted by the Owner to be an advisor and information conduit regarding the Project.
- 1.33 *Overhead*: General and administrative expenses of the Contractor's principal and branch offices, including payroll costs and other compensation of Contractor employees, deductibles paid on any insurance policy, charges against the Contractor for delinquent payments, and costs related to the correction of defective work, and the Contractor's capital expenses, including interest on capital used for the work.
- 1.34 *Performance and Payment Bonds (also known as Contract Bonds)*: The approved forms of security, furnished by the Contractor and their surety, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials and equipment by the Contractor.
- 1.35 *Post-Bid Addendum*: Document issued by the Consultant that defines a potential Change Order prior to signing of the construction contract. The Post-Bid Addendum allows the Owner to negotiate

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Definitions

contract changes with the Bidder submitting the lowest valid bid, only if the negotiated changes to the Bid Documents result in no change or no increase in the bid price.

A Post-Bid Addendum may also be issued after a competitive construction Bid opening to those Bidders who submitted a Bid initially, for the purpose of rebidding the Project work without re-advertising.

- 1.36 *Project*: The construction project proposed by the Owner to be constructed according to the Contract Documents. The Project, a public improvement, may be tied logistically to other public improvements and other activities conducted by the Owner or other contractors.
- 1.37 *Proposal (see also Change Order Proposal)*: The Contractor's written offer submitted to the Owner for consideration containing a specified dollar amount or rate, for a specific scope of work, and including a schedule impact, if any. A proposal shall include all costs for overhead and profit. The Contractor implements the work of a Proposal after it is accepted by all parties. Accepted Proposals are incorporated into the contract by Change Order.
- 1.38 *Proposal Request (PR)*: An Owner's written request to the Contractor for a Change Order Proposal.
- 1.39 *Punch List*: A document that identifies the items of work remaining to be done by the Contractor at the Close Out of a Project. The Punch List is created as a result of a final inspection of the work only after the Contractor attests that all of the Work is in its complete and permanent status.
- 1.40 *Request For Information (RFI)*: A Contractor's written request to the Consultant for clarification, definition or description of the Work. RFIs shall be presented by the Contractor in a timely manner to avoid any negative impact on the Schedule of the Work.
- 1.41 *Request For Proposal (RFP)*: An Owner's written request to the Contractor for a Change Order Proposal.
- 1.42 *Requisition for Payment*: The document in which the Contractor certifies that the Work described is, to the best of the Contractor's knowledge, information and belief, complete and that all previous payments have been paid by the Contractor to Subcontractors and suppliers, and that the current requested payment is now due. See *Schedule of Values*.
- 1.43 *Responsive and Responsible Bidder*: A bidder who complies, when submitting a bid on a given project, with the following *responsive* standards, as required by the Bid Documents:
 - submits specific qualifications to bid the project, if required;
 - attends mandatory pre-bid conferences, if required;
 - submits a bid prior to the close of the bid period;
 - submits a complete bid form;
 - submits a bid without indications of intent contrary to the stated requirements;
 - submits other materials and information, such as bid security, as required;
 and, meets the following minimums regarding these *responsible* standards:
 - sustains a satisfactory record of project performance;
 - maintains a permanent place of business in a known physical location;
 - possesses the financial means for short- and long-term operations;
 - possesses the appropriate technical experience and capabilities;
 - employs adequate personnel and subcontractor resources;

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maintains the equipment needed to perform the work;
complies with the proposed implementation schedule;
complies with the insurance and bonding requirements;
provides post-construction warranty coverage;
and other criteria which can be considered relevant to the contract.

- 1.44 *Retainage*: The amount, calculated at five percent (5%) of the contract value or a scheduled value, that the Owner shall withhold from the Contractor until the work or portion of work is declared substantially complete or otherwise accepted by the Owner. The Owner may, if requested, reduce the amount withheld if the Owner deems it desirable and prudent to do so. (See Title 5 M.R.S.A., Section 1746.)
- 1.45 *Sample*: A physical example provided by the Contractor which illustrates materials, equipment or workmanship and establishes standards by which the Work will be judged.
- 1.46 *Schedule of the Work*: The document prepared by the Contractor and approved by the Owner that specifies the dates on which the Contractor plans to begin and complete various parts of the Work, including dates on which information and approvals are required from the Owner.
- 1.47 *Schedule of Values*: The document prepared by the Contractor and approved by the Owner before the commencement of the Work that specifies the dollar values of discrete portions of the Work equal in sum to the contract amount. The Schedule of Values is used to document progress payments of the Work in regular (usually monthly) requisitions for payment. See *Requisition for Payment*.
- 1.48 *Shop Drawings*: The drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.
- 1.49 *Specifications*: The portion of the Contract Documents consisting of the written requirements of the Work for materials, equipment, systems, standards, workmanship, and performance of related services.
- 1.50 *Subcontractor*: An individual or entity undertaking the execution of any part of the Work by virtue of a written agreement with the Contractor or any other Subcontractor. Also, an individual or entity retained by the Contractor or any other Subcontractor as an independent contractor to provide the labor, materials, equipment or services necessary to complete a specific portion of the Work.
- 1.51 *Substantial Completion Date*: Point of time when the Work or a designated portion of the Work is sufficiently complete in compliance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended purpose without unscheduled disruption. Substantial Completion is documented by the date of the Certificate of Substantial Completion signed by the Owner and the Contractor.
- 1.52 *Superintendent*: The representative of the Contractor on the job site, authorized by the Contractor to receive and fulfill instructions from the Consultant.
- 1.53 *Surety*: The individual or entity that is legally bound with the Contractor and Subcontractor to insure the faithful performance of the contract and for the payment of the bills for labor, materials and equipment by the Contractor and Subcontractors.

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- 1.54 *Work*: The construction and services, whether completed or partially completed, including all labor, materials, equipment and services provided or to be provided by the Contractor and Subcontractors to fulfill the requirements of the Project as described in the Contract Documents.

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General Conditions

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1. Preconstruction Conference

- 1.1 The Contractor shall, upon acceptance of a contract and prior to commencing work, schedule a preconstruction conference with the Owner and Consultant. The purpose of this conference is as follows.
 - 1.1.1 Introduce all parties who have a significant role in the Project, including:
 - Owner (State agency or other contracting entity)
 - Owner's Representative
 - Consultant (Architect or Engineer)
 - Subconsultants
 - Clerk-of-the-works
 - Contractor (GC)
 - Superintendent
 - Subcontractors
 - Other State agencies
 - Construction testing company
 - Commissioning agent
 - Special Inspections agent
 - Bureau of General Services (BGS);
 - 1.1.2 Review the responsibilities of each party;
 - 1.1.3 Review any previously-identified special provisions of the Project;
 - 1.1.4 Review the Schedule of the Work calendar submitted by the Contractor to be approved by the Owner and Consultant;
 - 1.1.5 Review the Schedule of Values form submitted by the Contractor to be approved by the Owner and Consultant;
 - 1.1.6 Establish routines for Shop Drawing approval, contract changes, requisitions, et cetera;
 - 1.1.7 discuss jobsite issues;
 - 1.1.8 Discuss Project close-out procedures;
 - 1.1.9 Provide an opportunity for clarification of Contract Documents before work begins; and
 - 1.1.10 Schedule regular meetings at appropriate intervals for the review of the progress of the Work.

2. Intent and Correlation of Contract Documents

- 2.1 The intent of the Contract Documents is to describe the complete Project. The Contract Documents consist of various components; each component complements the others. What is shown as a requirement by any one component shall be inferred as a requirement on all corresponding components.
- 2.2 The Contractor shall furnish all labor, equipment and materials, tools, transportation, insurance, services, supplies, operations and methods necessary for, and reasonably incidental to, the construction and completion of the Project. Any work that deviates from the Contract Documents which appears to be required by the exigencies of construction or by inconsistencies in the Contract Documents, will be determined by the Consultant and authorized in writing by the Consultant, Owner and the Bureau prior to execution. The Contractor shall be responsible for requesting clarifying information where the intent of the Contract Documents is uncertain.
- 2.3 The Contractor shall not utilize any apparent error or omission in the Contract Documents to the disadvantage of the Owner. The Contractor shall promptly notify the Consultant in writing of

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General Conditions

such errors or omissions. The Consultant shall make any corrections or clarifications necessary in such a situation to document the true intent of the Contract Documents.

3. Additional Drawings and Specifications

- 3.1 Upon the written request of the Contractor, the Owner shall provide, at no expense to the Contractor, up to five sets of printed Drawings and Specifications for the execution of the Work.
- 3.2 The Consultant shall promptly furnish to the Contractor revised Drawings and Specifications, for the area of the documents where those revisions apply, when corrections or clarifications are made by the Consultant. All such information shall be consistent with, and reasonably inferred from, the Contract Documents. The Contractor shall do no work without the proper Drawings and Specifications.

4. Ownership of Contract Documents

- 4.1 The designs represented on the Contract Documents are the property of the Consultant. The Drawings and Specifications shall not be used on other work without consent of the Consultant.

5. Permits, Laws, and Regulations

- 5.1 The Owner is responsible for obtaining any zoning approvals or other similar local project approvals necessary to complete the Work, unless otherwise specified in the Contract Documents.
- 5.2 The Owner is responsible for obtaining Maine Department of Environmental Protection, Maine Department of Transportation, or other similar state government project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 5.3 The Owner is responsible for obtaining any federal agency project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 5.4 The Owner is responsible for obtaining all easements for permanent structures or permanent changes in existing facilities.
- 5.5 The Contractor is responsible for obtaining and paying for all permits and licenses necessary for the implementation of the Work. The Contractor shall notify the Owner of any delays, variance or restrictions that may result from the issuing of permits and licenses.
- 5.6 The Contractor shall comply with all ordinances, laws, rules and regulations and make all required notices bearing on the implementation of the Work. In the event the Contractor observes disagreement between the Drawings and Specifications and any ordinances, laws, rules and regulations, the Contractor shall promptly notify the Consultant in writing. Any necessary changes shall be made as provided in the contract for changes in the work. The Contractor shall not perform any work knowing it to be contrary to such ordinances, laws, rules and regulations.
- 5.7 The Contractor shall comply with local, state and federal regulations regarding construction safety and all other aspects of the Work.

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- 5.8 The Contractor shall comply with the Maine Code of Fair Practices and Affirmative Action, 5 M.R.S. §784 (2).

6. Taxes

- 6.1 The Owner is exempt from the payment of Maine State sales and use taxes as provided in 36 M.R.S. §1760 (1). The Contractor and Subcontractors shall not include taxes on exempt items in the construction contract.
- 6.2 Section 1760 further provides in subsection 61 that sales to a construction contractor or its subcontractor of tangible personal property that is to be physically incorporated in, and become a permanent part of, real property for sale to or owned by the Owner, are exempt from Maine State sales and use taxes. Tangible personal property is defined in 36 M.R.S. §1752 (17).
- 6.3 The Contractor may contact Maine Revenue Services, 24 State House Station, Augusta, Maine 04333 for guidance on tax exempt regulations authorized by 36 M.R.S. §1760 and detailed in Rule 302 (18-125 CMR 302).

7. Labor and Wages

- 7.1 The Contractor shall conform to the labor laws of the State of Maine, and all other laws, ordinances, and legal requirements affecting the work in Maine.
- 7.2 The Consultant shall include a wage determination document prepared by the Maine Department of Labor in the Contract Documents for state-funded contracts in excess of \$50,000. The document shows the minimum wages required to be paid to each category of labor employed on the project.
- 7.3 On projects requiring a Maine wage determination, the Contractor shall submit monthly payroll records to the Owner ("the contracting agency") showing the name and occupation of all workers and all independent contractors employed on the project. The monthly submission must also include the Contractor's company name, the title of the project, hours worked, hourly rate or other method of remuneration, and the actual wages or other compensation paid to each person.
- 7.4 The Contractor shall not reveal, in the payroll records submitted to the Owner, personal information regarding workers and independent contractors, other than the information described above. Such information shall not include Social Security number, employee identification number, or employee address or phone number, for example.
- 7.5 The Contractor shall conform to Maine statute (39-A M.R.S. §105-A (6)) by providing to the Workers' Compensation Board a list of all subcontractors and independent contractors on the job site and a record of the entity to whom that subcontractor or independent contractor is directly contracted and by whom that subcontractor or independent contractor is insured for workers' compensation purposes.
- 7.6 The Contractor shall enforce strict discipline and good order among their employees at all times, and shall not employ any person unfit or unskilled to do the work assigned to them.

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- 7.7 The Contractor shall promptly pay all employees when their compensation is due, shall promptly pay all others who have billed and are due for materials, supplies and services used in the Work, and shall promptly pay all others who have billed and are due for insurance, workers compensation coverage, federal and state unemployment compensation, and Social Security charges pertaining to this Project. Before final payments are made, the Contractor shall furnish to the Owner affidavits that all such payments described above have been made.
- 7.8 The Contractor may contact the Maine Department of Labor, 54 State House Station, Augusta, Maine 04333 for guidance on labor issues.
- 7.9 The Contractor may contact the Maine Workers' Compensation Board, 27 State House Station, Augusta, Maine 04333 for guidance on workers' compensation issues.

8. Indemnification

- 8.1 The Contractor shall indemnify and hold harmless the Owner and its officers and employees from and against any and all damages, liabilities, and costs, including reasonable attorney's fees, and defense costs, for any and all injuries to persons or property, including claims for violation of intellectual property rights, to the extent caused by the negligent acts or omissions of the Contractor, its employees, agents, officers or subcontractors in the performance of work under this Agreement. The Contractor shall not be liable for claims to the extent caused by the negligent acts or omissions of the Owner or for actions taken in reasonable reliance on written instructions of the Owner.
- 8.2 The Contractor shall notify the Owner promptly of all claims arising out of the performance of work under this Agreement by the Contractor, its employees or agents, officers or subcontractors.
- 8.3 This indemnity provision shall survive the termination of the Agreement, completion of the project or the expiration of the term of the Agreement.

9. Insurance Requirements

- 9.1 The Contractor shall provide, with each original of the signed Contract, an insurance certificate or certificates acceptable to the Owner and BGS. The Contractor shall submit insurance certificates to the Owner and BGS at the commencement of this Contract and at policy renewal or revision dates. The certificates shall identify the project name and BGS project number, and shall name the Owner as certificate holder and as additional insured for general liability and automobile liability coverages. The submitted forms shall contain a provision that coverage afforded under the insurance policies will not be canceled or materially changed unless at least ten days prior written notice by registered letter has been given to the Owner and BGS.
- 9.2 The Owner does not warrant or represent that the insurance required herein constitutes an insurance portfolio which adequately addresses all risks faced by the Contractor or its Subcontractors. The Contractor is responsible for the existence, extent and adequacy of insurance prior to commencement of work. The Contractor shall not allow any Subcontractor to commence work until all similar insurance required of the Subcontractor has been confirmed by the Contractor.

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- 9.3 The Contractor shall procure and maintain primary insurance for the duration of the Project and, if written on a Claims-Made basis, shall also procure and maintain Extended Reporting Period (ERP) insurance for the period of time that any claims could be brought. The Contractor shall ensure that all Subcontractors they engage or employ will procure and maintain similar insurance in form and amount acceptable to the Owner and BGS. At a minimum, the insurance shall be of the types and limits set forth herein protecting the Contractor from claims which may result from the Contractor's execution of the Work, whether such execution be by the Contractor or by those employed by the Contractor or by those for whose acts they may be liable. All required insurance coverages shall be placed with carriers authorized to conduct business in the State of Maine by the Maine Bureau of Insurance.
- 9.3.1 The Contractor shall have Workers' Compensation insurance for all employees on the Project site in accordance with the requirements of the Workers' Compensation law of the State of Maine. Minimum acceptable limits for Employer's Liability are:
- | | |
|--------------------------------|-------------------------|
| Bodily Injury by Accident..... | \$500,000 |
| Bodily Injury by Disease..... | \$500,000 Each Employee |
| Bodily Injury by Disease..... | \$500,000 Policy Limit |
- 9.3.2 The Contractor shall have Commercial General Liability insurance providing coverage for bodily injury and property damage liability for all hazards of the Project including premise and operations, products and completed operations, contractual, and personal injury liabilities. The policy shall include collapse and underground coverage as well as explosion coverage if explosion hazards exist. Aggregate limits shall apply on a location or project basis. Minimum acceptable limits are:
- | | |
|---|-------------|
| General aggregate limit..... | \$2,000,000 |
| Products and completed operations aggregate | \$1,000,000 |
| Each occurrence limit..... | \$1,000,000 |
| Personal injury aggregate | \$1,000,000 |
- 9.3.3 The Contractor shall have Automobile Liability insurance against claims for bodily injury, death or property damage resulting from the maintenance, ownership or use of all owned, non-owned and hired automobiles, trucks and trailers. Minimum acceptable limit is:
- | | |
|--------------------------------|-----------|
| Any one accident or loss | \$500,000 |
|--------------------------------|-----------|
- 9.3.4 For the portion of a project which is new construction, the Contractor shall procure and maintain Builder's Risk insurance naming the Owner, Contractor, and any Subcontractor as insureds as their interest may appear. Covered causes of loss form shall be all Risks of Direct Physical Loss, endorsed to include flood, earthquake, transit and sprinkler leakage where sprinkler coverage is applicable. Unless specifically authorized in writing by the Owner, the limit of insurance shall not be less than the initial contract amount, for the portion of the project which is new construction, and coverage shall apply during the entire contract period and until the work is accepted by the Owner.
- 9.3.5 The Contractor shall have Owner's Protective Liability insurance for contract values \$50,000 and above, naming the Owner as the Named Insured. Minimum acceptable limits are:
- | | |
|------------------------------|-------------|
| General aggregate limit..... | \$2,000,000 |
| Each occurrence limit..... | \$1,000,000 |

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10. Contract Bonds

- 10.1 When noted as required in the Bid Documents, the Contractor shall provide to the Owner a Performance Bond and a Payment Bond, or "contract bonds", upon execution of the contract. Each bond value shall be for the full amount of the contract and issued by a surety company authorized to do business in the State of Maine as approved by the Owner. The bonds shall be executed on the forms furnished in the Bid Documents. The bonds shall allow for any subsequent additions or deductions of the contract.
- 10.2 The contract bonds shall continue in effect for one year after final acceptance of the contract to protect the Owner's interest in connection with the one year guarantee of workmanship and materials and to assure settlement of claims for the payment of all bills for labor, materials and equipment by the Contractor.

11. Patents and Royalties

- 11.1 The Contractor shall, for all time, secure for the Owner the free and undisputed right to the use of any patented articles or methods used in the Work. The expense of defending any suits for infringement or alleged infringement of such patents shall be borne by the Contractor. Awards made regarding patent suits shall be paid by the Contractor. The Contractor shall hold the Owner harmless regarding patent suits that may arise due to installations made by the Contractor, and to any awards made as a result of such suits.
- 11.2 Any royalty payments related to the work done by the Contractor for the Project shall be borne by the Contractor. The Contractor shall hold the Owner harmless regarding any royalty payments that may arise due to installations made by the Contractor.

12. Surveys, Layout of Work

- 12.1 The Owner shall furnish all property surveys unless otherwise specified.
- 12.2 The Contractor is responsible for correctly staking out the Work on the site. The Contractor shall employ a competent surveyor to position all construction on the site. The surveyor shall run the axis lines, establish correct datum points and check each line and point on the site to insure their accuracy. All such lines and points shall be carefully preserved throughout the construction.
- 12.3 The Contractor shall lay out all work from dimensions given on the Drawings. The Contractor shall take measurements and verify dimensions of any existing work that affects the Work or to which the Work is to be fitted. The Contractor is solely responsible for the accuracy of all measurements. The Contractor shall verify all grades, lines, levels, elevations and dimensions shown on the Drawings and report any errors or inconsistencies to the Consultant prior to commencing work.

13. Record of Documents

- 13.1 The Contractor shall maintain one complete set of Contract Documents on the jobsite, in good order and current status, for access by the Owner and Consultant.
- 13.2 The Contractor shall maintain, continuously updated, complete records of Requests for Information, Architectural Supplemental Instructions (or equivalent), Information Bulletins,

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supplemental sketches, Change Order Proposals, Change Orders, Shop Drawings, testing reports, et cetera, for access by the Owner and Consultant.

14. Allowances

- 14.1 The Contract Price shall include all allowances described in the Contract Documents. The Contractor shall include all overhead and profit necessary to implement each allowance in their Contract Price.
- 14.2 The Contractor shall not be required to employ parties for allowance work against whom the Contractor has a reasonable objection. In such a case, the Contractor shall notify the Owner in writing of their position and shall propose an alternative party to complete the work of the allowance.

15. Shop Drawings

- 15.1 The Contractor shall administer Shop Drawings prepared by the Contractor, Subcontractors, suppliers or others to conform to the approved Schedule of the Work. The Contractor shall verify all field measurements, check and authorize all Shop Drawings and schedules required by the Work. The Contractor is the responsible party and contact for the Contractor's work as well as that of Subcontractors, suppliers or others who provide Shop Drawings.
- 15.2 The Consultant shall review and acknowledge Shop Drawings, with reasonable promptness, for general conformity with the design concept of the project and compliance with the information provided in the Contract Documents.
- 15.3 The Contractor shall provide monthly updated logs containing: requests for information, information bulletins, supplemental instructions, supplemental sketches, change order proposals, change orders, submittals, testing and deficiencies.
- 15.4 The Contractor shall make any corrections required by the Consultant, and shall submit a quantity of corrected copies as may be needed. The acceptance of Shop Drawings or schedules by the Consultant shall not relieve the Contractor from responsibility for deviations from Drawings and Specifications, unless the Contractor has called such deviations to the attention of the Consultant at the time of submission and secured the Consultant's written approval. The acceptance of Shop Drawings or schedules by the Consultant does not relieve the Contractor from responsibility for errors in Shop Drawings or schedules.

16. Samples

- 16.1 The Contractor shall furnish for approval, with reasonable promptness, all samples as directed by the Consultant. The Consultant shall review and approve such samples, with reasonable promptness, for general conformity with the design concept of the project and compliance with the information provided in the Contract Documents. The subsequent work shall be in accord with the approved samples.

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17. Substitutions

- 17.1 The Contractor shall furnish items and materials described in the Contract Documents. If the item or material specified describes a proprietary product, or uses the name of a manufacturer, the term “or approved equal” shall be implied, if it is not included in the text. The specific item or material specified establishes a minimum standard for the general design, level of quality, type, function, durability, efficiency, reliability, compatibility, warranty coverage, installation factors and required maintenance. The Drawing or written Specification shall not be construed to exclude other manufacturers products of comparable design, quality, and efficiency.
- 17.2 The Contractor may submit detailed information about a proposed substitution to the Consultant for consideration. Particular models of items and particular materials which the Contractor asserts to be equal to the items and materials identified in the Contract Documents shall be allowed only with written approval by the Consultant. The request for substitution shall include a cost comparison and a reason or reasons for the substitution.
- 17.3 The Consultant may request additional information about the proposed substitution. The approval or rejection of a proposed substitution may be based on timeliness of the request, source of the information, the considerations of minimum standards described above, or other considerations. The Consultant should briefly state the rationale for the decision. The decision shall be considered final.
- 17.4 The duration of a substitution review process can not be the basis for a claim for delay in the Schedule of the Work.

18. Assignment of Contract

- 18.1 The Contractor shall not assign or sublet the contract as a whole without the written consent of the Owner. The Contractor shall not assign any money due to the Contractor without the written consent of the Owner.

19. Separate Contracts

- 19.1 The Owner reserves the right to create other contracts in connection with this Project using similar General Conditions. The Contractor shall allow the Owner's other contractors reasonable opportunity for the delivery and storage of materials and the execution of their work. The Contractor shall coordinate and properly connect the Work of all contractors.
- 19.2 The Contractor shall promptly report to the Consultant and Owner any apparent deficiencies in work of the Owner's other contractors that impacts the proper execution or results of the Contractor. The Contractor's failure to observe or report any deficiencies constitutes an acceptance of the Owner's other contractors work as suitable for the interface of the Contractor's work, except for latent deficiencies in the Owner's other contractors work.
- 19.3 Similarly, the Contractor shall promptly report to the Consultant and Owner any apparent deficiencies in their own work that would impact the proper execution or results of the Owner's other contractors.

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- 19.4 The Contractor shall report to the Consultant and Owner any conflicts or claims for damages with the Owner's other contractors and settle such conflicts or claims for damages by mutual agreement or arbitration, if necessary, at no expense to the Owner.
- 19.5 In the event the Owner's other contractors sue the Owner regarding any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend such proceedings at the Contractor's expense. The Contractor shall pay or satisfy any judgment that may arise against the Owner, and pay all other costs incurred.

20. Subcontracts

- 20.1 The Contractor shall not subcontract any part of this contract without the written permission of the Owner.
- 20.2 The Contractor shall submit a complete list of named Subcontractors and material suppliers to the Consultant and Owner for approval by the Owner prior to commencing work. The Subcontractors named shall be reputable companies of recognized standing with a record of satisfactory work.
- 20.3 The Contractor shall not employ any Subcontractor or use any material until they have been approved, or where there is reason to believe the resulting work will not comply with the Contract Documents.
- 20.4 The Contractor, not the Owner, is as fully responsible for the acts and omissions of Subcontractors and of persons employed by them, as the Contractor is for the acts and omissions of persons directly or indirectly employed by the Contractor.
- 20.5 Neither the Contract Documents nor any Contractor-Subcontractor contract shall indicate, infer or create any direct contractual relationship between any Subcontractor and the Owner.

21. Contractor-Subcontractor Relationship

- 21.1 The Contractor shall be bound to the Subcontractor by all the obligations in the Contract Documents that bind the Contractor to the Owner.
- 21.2 The Contractor shall pay the Subcontractor, in proportion to the dollar value of the work completed and requisitioned by the Subcontractor, the approved dollar amount allowed to the Contractor no more than seven days after receipt of payment from the Owner.
- 21.3 The Contractor shall pay the Subcontractor accordingly if the Contract Documents or the subcontract provide for earlier or larger payments than described in the provision above.
- 21.4 The Contractor shall pay the Subcontractor for completed and requisitioned subcontract work, less retainage, no more than seven days after receipt of payment from the Owner for the Contractor's approved Requisition for Payment, even if the Consultant fails to certify a portion of the Requisition for Payment for a cause not the fault of the Subcontractor.
- 21.5 The Contractor shall not make a claim for liquidated damages or penalty for delay in any amount in excess of amounts that are specified by the subcontract.

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- 21.6 The Contractor shall not make a claim for services rendered or materials furnished by the Subcontractor unless written notice is given by the Contractor to the Subcontractor within ten calendar days of the day in which the claim originated.
- 21.7 The Contractor shall give the Subcontractor an opportunity to present and to submit evidence in any progress conference or disputes involving subcontract work.
- 21.8 The Contractor shall pay the Subcontractor a just share of any fire insurance payment received by the Contractor.
- 21.9 The Subcontractor shall be bound to the Contractor by the terms of the Contract Documents and assumes toward the Contractor all the obligations and responsibilities that the Contractor, by those documents, assumes toward the Owner.
- 21.10 The Subcontractor shall submit applications for payment to the Contractor in such reasonable time as to enable the Contractor to apply for payment as specified.
- 21.11 The Subcontractor shall make any claims for extra cost, extensions of time or damages, to the Contractor in the manner provided in these General Conditions for like claims by the Contractor to the Owner, except that the time for the Subcontractor to make claims for extra cost is seven calendar days after the receipt of Consultant's instructions.

22. Supervision of the Work

- 22.1 During all stages of the Work the Contractor shall have a competent superintendent, with any necessary assistant superintendents, overseeing the project. The superintendent shall not be reassigned without the consent of the Owner unless a superintendent ceases to be employed by the Contractor due to unsatisfactory performance.
- 22.2 The superintendent represents the Contractor on the jobsite. Directives given by the Consultant or Owner to the superintendent shall be as binding as if given directly to the Contractor's main office. All important directives shall be confirmed in writing to the Contractor. The Consultant and Owner are not responsible for the acts or omissions of the superintendent or assistant superintendents.
- 22.3 The Contractor shall provide supervision of the Work equal to the industry's highest standard of care. The superintendent shall carefully study and compare all Contract Documents and promptly report any error, inconsistency or omission discovered to the Consultant. The Contractor may not necessarily be held liable for damages resulting directly from any error, inconsistency or omission in the Contract Documents or other instructions by the Consultant that was not revealed by the superintendent in a timely way.

23. Observation of the Work

- 23.1 The Contractor shall allow the Owner, the Consultant and the Bureau continuous access to the site for the purpose of observation of the progress of the work. All necessary safeguards and accommodations for such observations shall be provided by the Contractor.

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- 23.2 The Contractor shall coordinate all required testing, approval or demonstration of the Work. The Contractor shall give sufficient notice to the appropriate parties of readiness for testing, inspection or examination.
- 23.3 The Contractor shall schedule inspections and obtain all required certificates of inspection for inspections by a party other than the Consultant.
- 23.4 The Consultant shall make all scheduled observations promptly, prior to the work being concealed or buried by the Contractor. If approval of the Work is required of the Consultant, the Contractor shall notify the Consultant of the construction schedule in this regard. Work concealed or buried prior to the Consultant's approval may need to be uncovered at the Contractor's expense.
- 23.5 The Consultant may order reexamination of questioned work, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to conform to the Contract Documents, the Owner shall pay the expense of the reexamination and remedial work. If the work is found to not conform to the Contract Documents, the Contractor shall pay the expense, unless the defect in the work was caused by the Owner's Contractor, whose responsibility the reexamination expense becomes.
- 23.6 The Bureau shall periodically observe the Work during the course of construction and make recommendations to the Contractor or Consultant as necessary. Such recommendations shall be considered and implemented through the usual means for changes to the Work.
24. Consultant's Status
- 24.1 The Consultant represents the Owner during the construction period, and observes the work in progress on behalf of the Owner. The Consultant has authority to act on behalf of the Owner only to the extent expressly provided by the Contract Documents or otherwise demonstrated to the Contractor. The Consultant has authority to stop the work whenever such an action is necessary, in the Consultant's reasonable opinion, to ensure the proper execution of the contract.
- 24.2 The Consultant is the interpreter of the conditions of the contract and the judge of its performance. The Consultant shall favor neither the Owner nor the Contractor, but shall use the Consultant's powers under the contract to enforce faithful performance by both parties.
- 24.3 In the event of the termination of the Consultant's employment on the project prior to completion of the work, the Owner shall appoint a capable and reputable replacement. The status of the new Consultant relative to this contract shall be that of the former Consultant.
25. Management of the Premises
- 25.1 The Contractor shall place equipment and materials, and conduct activities on the premises in a manner that does not unreasonably hinder site circulation, environmental stability, or any long term effect. Likewise, the Consultant's directions shall not cause the use of premises to be impeded for the Contractor or Owner.

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- 25.2 The Contractor shall not use the premises for any purpose other than that which is directly related to the scope of work. The Owner shall not use the premises for any purpose incompatible with the proposed work simultaneous to the work of the Contractor.
- 25.3 The Contractor shall enforce the Consultant's instructions regarding information posted on the premises such as signage and advertisements, as well as activities conducted on the premises such as fires, and smoking.
- 25.4 The Owner may occupy any part of the Project that is completed with the written consent of the Contractor, and without prejudice to any of the rights of the Owner or Contractor. Such use or occupancy shall not, in and of itself, be construed as a final acceptance of any work or materials.

26. Safety and Security of the Premises

- 26.1 The Contractor shall designate, and make known to the Consultant and the Owner, a safety officer whose duty is the prevention of accidents on the site.
- 26.2 The Contractor shall continuously maintain security on the premises and protect from unreasonable occasion of injury all people authorized to be on the job site. The Contractor shall also effectively protect the property and adjacent properties from damage or loss.
- 26.3 The Contractor shall take all necessary precautions to ensure the safety of workers and others on and adjacent to the site, abiding by applicable local, state and federal safety regulations. The Contractor shall erect and continuously maintain safeguards for the protection of workers and others, and shall post signs and other warnings regarding hazards associated with the construction process, such as protruding fasteners, moving equipment, trenches and holes, scaffolding, window, door or stair openings, and falling materials.
- 26.4 The Contractor shall restore the premises to conditions that existed prior to the start of the project at areas not intended to be altered according to the Contract Documents.
- 26.5 The Contractor shall protect existing utilities and exercise care working in the vicinity of utilities shown in the Drawings and Specifications or otherwise located by the Contractor.
- 26.6 The Contractor shall protect from damage existing trees and other significant plantings and landscape features of the site which will remain a permanent part of the site. If necessary or indicated in the Contract Documents, tree trunks shall be boxed and barriers erected to prevent damage to tree branches or roots.
- 26.7 The Contractor shall repair or replace damage to the Work caused by the Contractor's or Subcontractor's forces, including that which is reasonably protected, at the expense of the responsible party.
- 26.8 The Contractor shall not load, or allow to be loaded, any part of the Project with a force which imperils personal or structural safety. The Consultant may consult with the Contractor on such means and methods of construction, however, the ultimate responsibility lies with the Contractor.
- 26.9 The Contractor shall not jeopardize any work in place with subsequent construction activities such as blasting, drilling, excavating, cutting, patching or altering work. The Consultant must

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approve altering any structural components of the project. The Contractor shall supervise all construction activities carried out by others on site to ensure that the work is neatly done and in a manner that will not endanger the structure or the component parts.

- 26.10 The Contractor may act with their sole discretion in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Contractor may negotiate with the Owner for compensation for expenses due to such emergency work.
- 26.11 The Contractor and Subcontractors shall have no responsibility for the identification, discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous materials in any form at the project site. The Contractor shall avoid disruption of any hazardous materials or toxic substances at the project site and promptly notify the Owner in writing on the occasion of such a discovery.
- 26.12 The Contractor shall keep the premises free of any unsafe accumulation of waste materials caused by the work. The Contractor shall regularly keep the spaces "broom clean". See the Close-out of the Work provisions of this section regarding cleaning at the completion of the project.

27. Changes in the Work

- 27.1 The Contractor shall not proceed with extra work without an approved Change Order or Construction Change Directive. A Change Order which has been properly signed by all parties shall become a part of the contract.
- 27.2 A Change Order is the usual document for directing changes in the Work. In certain circumstances, however, the Owner may utilize a Construction Change Directive to direct the Contractor to perform changes in the Work that are generally consistent with the scope of the project. The Owner shall use a Construction Change Directive only when the normal process for approving changes to the Work has failed to the detriment of the Project, or when agreement on the terms of a Change Order cannot be met, or when an urgent situation requires, in the Owner's judgment, prompt action by the Contractor.
- 27.3 The Consultant shall prepare the Construction Change Directive representing a complete scope of work, with proposed Contract Price and Contract Time revisions, if any, clearly stated.
- 27.4 The Contractor shall promptly carry out a Construction Change Directive which has been signed by the Owner and the Consultant. Work thus completed by the Contractor constitutes the basis for a Change Order. Changes in the Contract Price and Contract Time shall be as defined in the Construction Change Directive unless subsequently negotiated with some other terms.
- 27.5 The method of determining the dollar value of extra work shall be by:
- .1 an estimate of the Contractor accepted by Owner as a lump sum, or
 - .2 unit prices named in the contract or subsequently agreed upon, or
 - .3 cost plus a designated percentage, or
 - .4 cost plus a fixed fee.

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- 27.6 The Contractor shall determine the dollar value of the extra work for both the lump sum and cost plus designated percentage methods so as not to exceed the following rates. The rates include all overhead and profit expenses.
- .1 Contractor - for any work performed by the Contractor's own forces, up to 20% of the cost;
 - .2 Subcontractor - for work performed by Subcontractor's own forces, up to 20% of the cost;
 - .3 Contractor - for work performed by Contractor's Subcontractor, up to 10% of the amount due the Subcontractor.
- 27.7 The Contractor shall keep and provide records as needed or directed for the cost plus designated percentage method. The Consultant shall review and certify the appropriate amount which includes the Contractor's overhead and profit. The Owner shall make payments based on the Consultant's certificate.
- 27.8 Cost reflected in Change Orders shall be limited to the following: cost of materials, cost of delivery, cost of labor (including Social Security, pension, Workers' Compensation insurance, and unemployment insurance), and cost of rental of power tools and equipment. Labor cost may include a pro-ratio share of a foreman's time only in the case of an extension of contract time granted due to the Change Order.
- 27.9 Overhead reflected in Change Orders shall be limited to the following: bond premium, supervision, wages of clerks, time keepers, and watchmen, small tools, incidental expenses, general office expenses, and all other overhead expenses directly related to the Change Order.
- 27.10 The Contractor shall provide credit to the Owner for labor, materials, equipment and other costs but not overhead and profit expenses for those Change Order items that result in a net value of credit to the contract.
- 27.11 The Owner may change the scope of work of the Project without invalidating the contract. The Owner shall notify the Contractor of a change of the scope of work for the Owner's Contractors, which may affect the work of this Contractor, without invalidating the contract. Change Orders for extension of the time caused by such changes shall be developed at the time of directing the change in scope of work.
- 27.12 The Consultant may order minor changes in the Work, not involving extra cost, which is consistent with the intent of the design or project.
- 27.13 The Contractor shall immediately give written notification to the Consultant of latent conditions discovered at the site which materially differ from those represented in the Drawings or Specifications, and which may eventually result in a change in the scope of work. The Contractor shall suspend work until receiving direction from the Consultant. The Consultant shall promptly investigate the conditions and respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Consultant shall determine if the discovered conditions warrant a Change Order.
- 27.14 The Contractor shall, within ten calendar days of receipt of the information, give written notification to the Consultant if the Contractor claims that instructions by the Consultant will constitute extra cost not accounted for by Change Order or otherwise under the contract. The Consultant shall promptly respond to the Contractor's notice with direction that avoids any

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unnecessary delay of the Work. The Consultant shall determine if the Contractor's claim warrants a Change Order.

28. Correction of the Work

- 28.1 The Contractor shall promptly remove from the premises all work the Consultant declares is non-conforming to the contract. The Contractor shall replace the work properly at no expense to the Owner. The Contractor is also responsible for the expenses of others whose work was damaged or destroyed by such remedial work.
- 28.2 The Owner may elect to remove non-conforming work if it is not removed by the Contractor within a reasonable time, that time defined in a written notice from the Consultant. The Owner may elect to store removed non-conforming work not removed by the Contractor at the Contractor's expense. The Owner may, with ten days written notice, dispose of materials which the Contractor does not remove. The Owner may sell the materials and apply the net proceeds, after deducting all expenses, to the costs that should have been borne by the Contractor.
- 28.3 The Contractor shall remedy any defects due to faulty materials or workmanship and pay for any related damage to other work which appears within a period of one year from the date of substantial completion, and in accord with the terms of any guarantees provided in the contract. The Owner shall promptly give notice of observed defects to the Contractor and Consultant. The Consultant shall determine the status of all claimed defects. The Contractor shall perform all remedial work without unjustifiable delay in either the initial response or the corrective action.
- 28.4 The Consultant may authorize, after a reasonable notification to the Contractor, an equitable deduction from the contract amount in lieu of the Contractor correcting non-conforming or defective work.

29. Owner's Right to do Work

- 29.1 The Owner may, using other contractors, correct deficiencies attributable to the Contractor, or complete unfinished work. Such action shall take place only after giving the Contractor three days written notice, and provided the Consultant approves of the proposed course of action as an appropriate remedy. The Owner may then deduct the cost of the remedial work from the amount due the Contractor.
- 29.2 The Owner may act with their sole discretion when the Contractor is unable to take action in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Owner shall inform the Contractor of the emergency work performed, particularly where it may affect the work of the Contractor.

30. Termination of Contract and Stop Work Action

- 30.1 The Owner may, owing to a certificate of the Consultant indicating that sufficient cause exists to justify such action, without prejudice to any other right or remedy and after giving the Contractor and the Contractor's surety seven days written notice, terminate the employment of the

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Contractor. At that time the Owner may take possession of the premises and of all materials, tools and appliances on the premises and finish the work by whatever method the Owner may deem expedient. Cause for such action by the Owner includes:

- .1 the contractor is adjudged bankrupt, or makes a general assignment for the benefit of its creditors, or
- .2 a receiver is appointed due to the Contractor's insolvency, or
- .3 the Contractor persistently or repeatedly refuses or fails to provide enough properly skilled workers or proper materials, or
- .4 the Contractor fails to make prompt payment to Subcontractors or suppliers of materials or labor, or
- .5 the Contractor persistently disregards laws, ordinances or the instructions of the Consultant, or is otherwise found guilty of a substantial violation of a provision of the Contract Documents.

- 30.2 The Contractor is not entitled, as a consequence of the termination of the employment of the Contractor as described above, to receive any further payment until the Work is finished. If the unpaid balance of the contract amount exceeds the expense of finishing the Work, including compensation for additional architectural, managerial and administrative services, such balance shall be paid to the Contractor. If the expense of finishing the Work exceeds the unpaid balance, the Contractor shall pay the difference to the Owner. The Consultant shall certify the expense incurred by the Contractor's default. This obligation for payment shall continue to exist after termination of the contract.
- 30.3 The Contractor may, if the Work is stopped by order of any court or other public authority for a period of thirty consecutive days, and through no act or fault of the Contractor or of anyone employed by the Contractor, with seven days written notice to the Owner and the Consultant, terminate this contract. The Contractor may then recover from the Owner payment for all work executed, any proven loss and reasonable profit and damage.
- 30.4 The Contractor may, if the Consultant fails to issue a certificate for payment within seven days after the Contractor's formal request for payment, through no fault of the Contractor, or if the Owner fails to pay to the Contractor within 30 days after submission of any sum certified by the Consultant, with seven days written notice to the Owner and the Consultant, stop the Work or terminate this Contract.

31. Delays and Extension of Time

- 31.1 The completion date of the contract shall be extended if the work is delayed by changes ordered in the work which have approved time extensions, or by an act or neglect of the Owner, the Consultant, or the Owner's Contractor, or by strikes, lockouts, fire, flooding, unusual delay in transportation, unavoidable casualties, or by other causes beyond the Contractor's control. The Consultant shall determine the status of all claimed causes.
- 31.2 The contract shall not be extended for delay occurring more than seven calendar days before the Contractor's claim made in writing to the Consultant. In case of a continuing cause of delay, only one claim is necessary.
- 31.3 The contract shall not be extended due to failure of the Consultant to furnish drawings if no schedule or agreement is made between the Contractor and the Consultant indicating the dates

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which drawings shall be furnished and fourteen calendar days has passed after said date for such drawings.

- 31.4 This article does not exclude the recovery of damages for delay by either party under other provisions in the Contract Document.

32. Payments to the Contractor

- 32.1 As noted under *Preconstruction Conference* in this section, the Contractor shall submit a Schedule of Values form, before the first application for payment, for approval by the Owner and Consultant. The Consultant may direct the Contractor to provide evidence that supports the correctness of the form. The approved Schedule of Values shall be used as a basis for payments.
- 32.2 The Contractor shall submit an application for each payment ("Requisition for Payment") on a form approved by the Owner and Consultant. The Consultant may require receipts or other documents showing the Contractor's payments for materials and labor, including payments to Subcontractors.
- 32.3 The Contractor shall submit Requisitions for Payment as the work progresses not more frequently than once each month, unless the Owner approves a more frequent interval due to unusual circumstances. The Requisition for Payment is based on the proportionate quantities of the various classes of work completed or incorporated in the Work, in agreement with the actual progress of the Work and the dollar value indicated in the Schedule of Values.
- 32.4 The Consultant shall verify and certify each Requisition for Payment which appears to be complete and correct prior to payment being made by the Owner. The Consultant may certify an appropriate amount for materials not incorporated in the Work which have been delivered and suitably stored at the site. The Contractor shall submit bills of sale, insurance certificates, or other such documents that will adequately protect the Owner's interests prior to payments being certified.
- 32.5 In the event any materials delivered but not yet incorporated in the Work have been included in a certified Requisition for Payment with payment made, and said materials thereafter are damaged, deteriorated or destroyed, or for any reason whatsoever become unsuitable or unavailable for use in the Work, the full amount previously allowed shall be deducted from subsequent payments unless the Contractor satisfactorily replaces said material.
- 32.6 The Contractor may request certification of an appropriate dollar amount for materials not incorporated in the Work which have been delivered and suitably stored away from the site. The Contractor shall submit bills of sale, insurance certificates, right-of-entry documents or other such documents that will adequately protect the Owner's interests. The Consultant shall determine if the Contractor's documentation for the materials is complete and specifically designated for the Project. The Owner may allow certification of such payments.
- 32.7 Subcontractors may request, and shall receive from the Consultant, copies of approved Requisitions for Payment showing the amounts certified in the Schedule of Values.
- 32.8 Certified Requisitions for Payment, payments made to the Contractor, or partial or entire occupancy of the project by the Owner shall not constitute an acceptance of any work that does

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not conform to the Contract Documents. The making and acceptance of the final payment constitutes a waiver of all claims by the Owner, other than those arising from unsettled liens, from faulty work or materials appearing within one year from final payment or from requirements of the Drawings and Specifications, and of all claims by the Contractor, except those previously made and still unsettled.

33. Payments Withheld

- 33.1 The Owner shall retain five percent of each payment due the Contractor as part security for the fulfillment of the contract by the Contractor. The Owner may make payment of a portion of this “retainage” to the Contractor temporarily or permanently during the progress of the Work. The Owner may thereafter withhold further payments until the full amount of the five percent is reestablished. The Contractor may deposit with the Maine State Treasurer certain securities in place of retainage amounts due according to Maine Statute (5 M.R.S. §1746).
- 33.2 The Consultant may withhold or nullify the whole or a portion of any Requisitions for Payment submitted by the Contractor in the amount that may be necessary, in his reasonable opinion, to protect the Owner from loss due to any of the following:
- .1 defective work not remedied;
 - .2 claims filed or reasonable evidence indicating probable filing of claims;
 - .3 failure to make payments properly to Subcontractors or suppliers;
 - .4 a reasonable doubt that the contract can be completed for the balance then unpaid;
 - .5 liability for damage to another contractor.

The Owner shall make payment to the Contractor, in the amount withheld, when the above circumstances are removed.

34. Liens

- 34.1 The Contractor shall deliver to the Owner a complete release of all liens arising out of this contract before the final payment or any part of the retainage payment is released. The Contractor shall provide with the release of liens an affidavit asserting each release includes all labor and materials for which a lien could be filed. Alternately, the Contractor, in the event any Subcontractor or supplier refuses to furnish a release of lien in full, may furnish a bond satisfactory to the Owner, to indemnify the Owner against any lien.
- 34.2 In the event any lien remains unsatisfied after all payments to the Contractor are made by the Owner, the Contractor shall refund to the Owner all money that the latter may be compelled to pay in discharging such lien, including all cost and reasonable attorney’s fees.

35. Workmanship

- 35.1 The Contractor shall provide materials, equipment, and installed work equal to or better than the quality specified in the Contract Documents and approved in submittal and sample. The installation methods shall be of the highest standards, and the best obtainable from the respective trades. The Consultant’s decision on the quality of work shall be final.

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- 35.2 The Contractor shall know local labor conditions for skilled and unskilled labor in order to apply the labor appropriately to the Work. All labor shall be performed by individuals well skilled in their respective trades.
- 35.3 The Contractor shall perform all cutting, fitting, patching and placing of work in such a manner to allow subsequent work to fit properly, whether that be by the Contractor, the Owner's Contractors or others. The Owner and Consultant may advise the Contractor regarding such subsequent work. Notwithstanding the notification or knowledge of such subsequent work, the Contractor may be directed to comply with this standard of compatible construction by the Consultant at the Contractor's expense.
- 35.4 The Contractor shall request clarification or revision of any design work by the Consultant, prior to commencing that work, in a circumstance where the Contractor believes the work cannot feasibly be completed at the highest quality, or as indicated in the Contract Documents. The Consultant shall respond to such requests in a timely way, providing clarifying information, a feasible revision, or instruction allowing a reduced quality of work. The Contractor shall follow the direction of the Consultant regarding the required request for information.
- 35.5 The Contractor shall guarantee the Work against any defects in workmanship and materials for a period of one year commencing with the date of the Certificate of Substantial Completion, unless specified otherwise for specific elements of the project. The Work may also be subdivided in mutually agreed upon components, each defined by a separate Certificate of Substantial Completion.
36. Close-out of the Work
- 36.1 The Contractor shall remove from the premises all waste materials caused by the work. The Contractor shall make the spaces "broom clean" unless a more thorough cleaning is specified. The Contractor shall clean all windows and glass immediately prior to the final inspection, unless otherwise directed.
- 36.2 The Owner may conduct the cleaning of the premises where the Contractor, duly notified by the Consultant, fails to adequately complete the task. The expense of this cleaning may be deducted from the sum due to the Contractor.
- 36.3 The Contractor shall participate in all final inspections and acknowledge the documentation of unsatisfactory work, customarily called the "punch list", to be corrected by the Contractor. The Consultant shall document the successful completion of the Work in a dated Certificate of Substantial Completion, to be signed by Owner, Consultant, and Contractor.
- 36.4 The Contractor shall not call for final inspection of any portion of the Work that is not completely and permanently installed. The Contractor may be found liable for the expenses of individuals called to final inspection meetings prematurely.
- 36.5 The Contractor and all major Subcontractors shall participate in the end-of-warranty-period conference, typically scheduled close to one year after the Substantial Completion date.

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General Conditions

37. Date of Completion and Liquidated Damages

- 37.1 The Contractor may make a written request to the Owner for an extension or reduction of time, if necessary. The request shall include the reasons the Contractor believes justifies the proposed completion date. The Owner may grant the revision of the contract completion date if the Work was delayed due to conditions beyond the control and the responsibility of the Contractor. The Contractor shall not conduct unauthorized accelerated work or file delay claims to recover alleged damages for unauthorized early completion.
- 37.2 The Contractor shall vigorously pursue the completion of the Work and notify the Owner of any factors that have, may, or will affect the approved Schedule of the Work. The Contractor may be found responsible for expenses of the Owner or Consultant if the Contractor fails to make notification of project delays.
- 37.3 The Project is planned to be done in an orderly fashion which allows for an iterative submittal review process, construction administration including minor changes in the Work and some bad weather. The Contractor shall not file delay claims to recover alleged damages on work the Consultant determines has followed the expected rate of progress.
- 37.4 The Consultant shall prepare the Certificate of Substantial Completion which, when signed by the Owner and the Contractor, documents the date of Substantial Completion of the Work or a designated portion of the Work. The Owner shall not consider the issuance of a Certificate of Occupancy by an outside authority a prerequisite for Substantial Completion if the Certificate of Occupancy cannot be obtained due to factors beyond the Contractor's control.
- 37.5 Liquidated Damages may be deducted from the sum due to the Contractor for each calendar day that the Work remains uncompleted after the completion date specified in the Contract or an approved amended completion date. The dollar amount per day shall be calculated using the Schedule of Liquidated Damages table shown below.

If the original contract amount is:	The per day Liquidated Damages shall be:
Less than \$100,000	\$250
\$100,000 to less than \$2,000,000	\$750
\$2,000,000 to less than \$10,000,000	\$1,500
\$10,000,000 and greater	\$1,500 plus \$250 for each \$2,000,000 over \$10,000,000

38. Dispute Resolution

38.1 Mediation

- 38.1.1 A dispute between the parties which arises under this Contract which cannot be resolved through informal negotiation, shall be submitted to a neutral mediator jointly selected by the parties.
- 38.1.2 Either party may file suit before or during mediation if the party, in good faith, deems it to be necessary to avoid losing the right to sue due to a statute of limitations. If suit is filed before good faith mediation efforts are completed, the party filing suit shall agree to stay all proceedings in the lawsuit pending completion of the mediation process, provided such stay is without prejudice.

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General Conditions

38.1.3 In any mediation between the Owner and the Consultant, the Owner has the right to consolidate related claims between Owner and Contractor.

38.2 Arbitration

38.2.1 If the dispute is not resolved through mediation, the dispute shall be settled by arbitration. The arbitration shall be conducted before a panel of three arbitrators. Each party shall select one arbitrator; the third arbitrator shall be appointed by the arbitrators selected by the parties. The arbitration shall be conducted in accordance with the Maine Uniform Arbitration Act (MUAA), except as otherwise provided in this section.

38.2.2 The decision of the arbitrators shall be final and binding upon all parties. The decision may be entered in court as provided in the MUAA.

38.2.3 The costs of the arbitration, including the arbitrators' fees shall be borne equally by the parties to the arbitration, unless the arbitrator orders otherwise.

38.2.4 In any arbitration between the Owner and the Consultant, the Owner has the right to consolidate related claims between Owner and Contractor.

00 73 46
Wage Determination Schedule

PART 1- GENERAL

1.1 Related Documents

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

1.2 Summary

- A. This Section includes the wage determination requirements for Contractors as issued by the State of Maine Department of Labor Bureau of Labor Standards or the United States Department of Labor.

1.3 Requirements

- A. Conform to the wage determination schedule for this project which is shown on the following page.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

State of Maine
Department of Labor
Bureau of Labor Standards
Augusta, Maine 04333-0045
Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRS §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid to laborers and workers employed on the below titled project.

2026 Fair Minimum Wage Rates – Building 2 York County (other than 1 & 2 family homes)

Occupational Title	Minimum Wage	Minimum Benefit	Total
Brickmasons and Blockmasons	\$43.91	\$11.02	\$54.93
Bulldozer Operator	\$30.62	\$5.38	\$36.00
Carpenter	\$30.01	\$19.69	\$49.70
Cement Masons and Concrete Finisher	\$23.95	\$2.73	\$26.68
Construction and Maintenance Painters	\$26.23	\$2.81	\$29.04
Construction Laborer	\$21.90	\$19.72	\$41.62
Conveyor Operators and Tenders	\$30.17	\$13.77	\$43.94
Crane and Tower Operators	\$40.43	\$8.63	\$49.06
Crushing Grinding and Polishing Machine Operators	\$26.15	\$3.24	\$29.39
Earth Drillers - Except Oil and Gas	\$25.04	\$3.77	\$28.81
Electrical Power - Line Installer and Repairers	\$48.12	\$15.63	\$63.75
Electricians	\$38.75	\$21.52	\$60.27
Elevator Installers and Repairers	\$72.19	\$44.52	\$116.71
Excavator Operator	\$31.75	\$5.53	\$37.28
Fence Erectors	\$26.69	\$3.29	\$29.98
Flaggers	\$21.39	\$0.86	\$22.25
Floor Layers - Except Carpet/Wood/Hard Tiles	\$29.00	\$8.65	\$37.65
Glaziers	\$39.32	\$19.22	\$58.54
Hazardous Materials Removal Workers	\$25.01	\$2.04	\$27.05
Heating and Air Conditioning and Refrigeration Mechanics and Installers	\$36.11	\$6.39	\$42.50
Heavy and Tractor - Trailer Truck Drivers	\$26.10	\$4.07	\$30.17
Highway Maintenance Workers	\$23.30	\$1.14	\$24.44
Industrial Machinery Mechanics	\$29.97	\$6.74	\$36.71
Industrial Truck and Tractor Operators	\$24.61	\$4.21	\$28.82
Insulation Worker - Mechanical	\$28.57	\$17.06	\$45.63
Light Truck or Delivery Services Drivers	\$26.79	\$5.14	\$31.93
Loading Machine and Dragline Operators	\$32.79	\$4.40	\$37.19
Millwrights	\$35.99	\$10.52	\$46.51
Mobile Heavy Equipment Mechanics - Except Engines	\$26.43	\$5.48	\$31.91
Operating Engineers and Other Equipment Operators	\$47.25	\$31.30	\$78.55
Paving Surfacing and Tamping Equipment Operators	\$30.74	\$10.67	\$41.41
Pile-Driver Operators	\$37.15	\$3.12	\$40.27
Pipe/Steam/Sprinkler Fitter	\$43.76	\$25.44	\$69.20
Pipelayers	\$28.75	\$3.64	\$32.39
Plumbers	\$40.00	\$24.71	\$64.71
Radio Cellular and Tower Equipment Installers	\$34.72	\$5.63	\$40.35
Reinforcing Iron and Rebar Workers	\$48.19	\$1.93	\$50.12
Riggers	\$27.16	\$21.25	\$48.41
Roofers	\$28.42	\$4.56	\$32.98
Sheet Metal Workers	\$30.18	\$6.64	\$36.82
Structural Iron and Steel Workers	\$32.94	\$25.00	\$57.94
Tapers	\$31.43	\$5.47	\$36.90
Telecommunications Equipment Installers and Repairers - Except Line Installers	\$32.28	\$14.53	\$46.81
Telecommunications Line Installers and Repairers	\$30.00	\$2.20	\$32.20
Tile and Marble Setters	\$28.91	\$5.46	\$34.37

Welders are classified as the trade to which welding is incidental (e.g. welding structural steel is Structural Iron and Steel Worker)

Apprentices – The minimum wage rates for registered apprentices are the rates recognized in the sponsorship agreement for registered apprentices working in the pertinent classification.

For any other specific trade on this project not listed above, contact the Bureau of Labor Standards for further clarification.

Title 26 §1310 requires that a clearly legible statement of all fair minimum wage and benefits rates to be paid the several classes of laborers, workers and mechanics employed on the construction on the public work must be kept posted in a prominent and easily accessible place at the site by each contractor and subcontractor subject to sections 1304 to 1313.

Appeal – Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates.

A true copy

Attest: 
Scott R. Cotnoir
Wage & Hour Director
Bureau of Labor Standards

Supersedes 02-03-2025
Effective 01-10-2026

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Alternates
3. Work under separate contracts.
4. Access to site.
5. Coordination with occupants.
6. Work restrictions.
7. Specification and drawing conventions.
8. Liquidated damages
9. Miscellaneous
10. Schedule.
11. List of Drawings

1.2 PROJECT INFORMATION

A. Project Identification: BGS Project #3818, Building Management System Replacement, Classroom Building, York County Community College.

B. Project Location: 112 College Drive, Wells, ME.

C. Owner: York County Community College

D. Owner's Representative: Michael McNeil, Director of Institutional Operations, York County Community College, mmcneil@mainecc.edu, 207-216-4336

E. Engineer/Project Manager: Richard Grondin, PE, Integrated Energy Systems, PLLC, 301 Middle Road, Falmouth, ME 04105-1229, 207-781-4263, rgrondin@iespllc.com

The Work of Project is defined by the Contract Documents and consists of replacing the building automation system at the York County Community College Classroom Building with application-specific, configurable control system utilizing open communication protocol. Work includes removing the existing direct digital control system which serves 18 rooftop units, two air handlers, VAV boxes, reheat coils, fans, boiler system, and exterior lighting; reusing devices and providing new pre-configured controllers and software.

F. Contract:

1. Project will be constructed under a single prime contract.
2. The Agreement for the Work shall be as written on 00 52 13 "Contract Agreement."
3. Contractor shall provide insurance as specified in Section 00 72 13 "General Conditions."

1.3 ALTERNATES

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 of Alternates:

1. Alternate No. 1: Additional Control Points: Connect existing HVAC equipment to the building management system and provide additional temperature sensors:

- a. CUH-2 cabinet unit heater fan relay and room sensor
- b. CUH-4 cabinet unit heater fan relay and room sensor
- c. Data Closet Room 126 room temperature sensor
- d. Office 127/121A finned-radiation control valve and room temperature sensor
- e. Office 201C finned-radiation control valve and room temperature sensor
- f. Data Closet Room 201J room temperature sensor
- g. Toilet 241A finned-radiation control valve and room temperature sensor
- h. Toilet 245 finned-radiation control valve and room temperature sensor
- i. Facilities Room 118 gas unit heater start/stop and room temperature sensor
- j. Mechanical/Boiler Room 118B gas unit heater start/stop and room temperature sensor
- k. Office Room 127, domestic hot water electric heat tracing, and one alarm output from each of the two Captiveaire kitchen hood systems.

1.4 WORK UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

B. Concurrent Work: Owner will be cleaning and performing miscellaneous repairs. Those operations will be conducted simultaneously with work under this Contract.

1.5 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

- a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
- b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

- A. Work Restrictions, General:
1. During the summer, the boiler system can remain offline. The building will remain occupied during construction; therefore, the entire building HVAC system cannot be taken offline at one time. The control work for each zone area (AHU1, AHU2, and each RTU), shall be done one at a time to maintain air conditioning and ventilation for most of the building. Each zone can run on its standalone controller during construction without being connected to the network controller.
 2. Toilet exhaust and domestic hot water shall operate during occupied periods during construction through manual control or through a controller. Work performed during March break shall not disrupt the existing communication bus between the existing controllers.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 6 a.m. to 5 p.m., Monday through Friday, unless otherwise indicated. Weekend Hours: Upon request.
- C. 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 Engineer and Owner not less than five days in advance of proposed utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Engineer and Owner not less than two days in advance of proposed disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or on the property.
- F. Controlled Substances: Use of tobacco products and other controlled substances on the project site are not permitted.
- G. Employee Identification: Owner will provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.
- H. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
1. Maintain list of approved screened personnel with Owner's representative.

1.8 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.

1.9 SCHEDULE

a. Advertise	September 29 to October 13, 2026
b. Pre-bid Meeting	2:30 pm, October 15, 2026
c. Bids due	1:30 pm, November 17, 2026
d. Award Contract	December 3, 2026
e. On-site construction	March 8-13, 2026, May 10-August 26, 2027
f. Commissioning	August 3-14, 2027
g. Substantial Completion	August 21, 2027
h. Project Closeout	August 28, 2027
i. Classes Begin	August 31, 2027

1.10 LIST OF DRAWINGS (Dated September 29, 2026)

- a. M0.1 DRAWING LIST, GENERAL NOTES, LEGEND & ABBREVIATIONS
- b. M0.2 NETWORK LAYOUT
- c. M1.1 FIRST FLOOR SOUTH PLAN
- d. M1.2 FIRST FLOOR NORTH PLAN
- e. M1.3 SECOND FLOOR SOUTH PLAN
- f. M1.4 SECOND FLOOR NORTH PLAN
- g. M1.5 ROOF PLAN

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Definitions.
- B. Submittal procedures.
- C. Proposed product list.
- D. Product data.
- E. Use of electronic CAD files of Project Drawings.
- F. Shop Drawings.
- G. Samples.
- H. Other submittals.
- I. Design data.
- J. Test reports.
- K. Manufacturer's instructions.
- L. Contractor review.
- M. Architect/Engineer review.

1.2 DEFINITIONS

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

1.3 SUBMITTAL PROCEDURES

- A. Transmit each submittal with AIA G810 - Transmittal Letter or Architect/Engineer or similar form.
- B. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify: Project, Contractor, Subcontractor and supplier, pertinent Drawing and detail number, and Specification Section number appropriate to submittal.
- D. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.

- E. Schedule submittals to expedite Project, and submit electronic submittals via email as PDF electronic files. Coordinate submission of related items.
- F. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.
- G. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- H. Allow space on submittals for Contractor and Architect/Engineer review stamps.
- I. When revised for resubmission, identify changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- K. Submittals not requested will not be recognized nor processed.
- L. Incomplete Submittals: Architect/Engineer will not review. Complete submittals for each item are required. Delays resulting from incomplete submittals are not the responsibility of Architect/Engineer.

1.4 PROPOSED PRODUCT LIST

- A. Within 15 days after date of Owner-Contractor Agreement, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, indicate manufacturer, trade name, model or catalog designation, and reference standards.

1.5 PRODUCT DATA

- A. Product Data: Action Submittal: Submit to Architect/Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Submit electronic submittals via email as PDF electronic files.
- C. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- D. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.6 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

- A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Shop Drawings for the Project. Use for other Projects or purposes is not allowed.
- B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
 - 1. Use of files is solely at receiver's risk. Architect/Engineer does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in

- Contract Documents, notify Architect/Engineer of discrepancy and use information in hard-copy Drawings and Specifications.
2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
 4. Receiver shall not hold Architect/Engineer responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
 5. Receiver shall understand that even though Architect/Engineer has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
 6. Receiver shall not hold Architect/Engineer responsible for such viruses or their consequences, and shall hold Architect/Engineer harmless against costs, losses, or damage caused by presence of computer virus in files or media.

1.7 SHOP DRAWINGS

- A. Shop Drawings: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. When required by individual Specification Sections, provide Shop Drawings signed and sealed by a professional Engineer responsible for designing components shown on Shop Drawings.
 1. Include signed and sealed calculations to support design.
 2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
 3. Make revisions and provide additional information when required by authorities having jurisdiction.
- D. Submit electronic submittals via email as PDF electronic files.
- E. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.8 SAMPLES

- A. Samples: Action Submittal: Submit to Architect/Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for Selection as Specified in Product Sections:
 1. Submit to Architect/Engineer for aesthetic, color, and finish selection.
 2. Submit Samples of finishes, textures, and patterns for Architect/Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample submittals for interfacing work.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of Samples specified in individual Specification Sections; Architect/Engineer will retain one Sample.

- F. Reviewed Samples that may be used in the Work are indicated in individual Specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in Specification Section.
- H. After review, produce copies and distribute according to "Submittal Procedures" Article and for record documents described in Section 01 70 00 - Execution and Closeout Requirements.

1.9 OTHER SUBMITTALS

- A. Closeout Submittals: Comply with Section 01 70 00 - Execution and Closeout Requirements.
- B. Informational Submittal: Submit data for Architect/Engineer's knowledge as Contract administrator or for Owner.
- C. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

1.10 TEST REPORTS

- A. Informational Submittal: Submit reports for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit test reports for information for assessing conformance with information given and design concept expressed in Contract Documents.

1.11 MANUFACTURER'S INSTRUCTIONS

- A. Informational Submittal: Submit manufacturer's installation instructions for Architect/Engineer's knowledge as Contract administrator or for Owner.
- B. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Architect/Engineer in quantities specified for Product Data.
- C. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.12 CONTRACTOR REVIEW

- A. Review for compliance with Contract Documents and approve submittals before transmitting to Architect/Engineer.
- B. Contractor: Responsible for:
 - 1. Determination and verification of materials including manufacturer's catalog numbers.
 - 2. Determination and verification of field measurements and field construction criteria.
 - 3. Checking and coordinating information in submittal with requirements of Work and of Contract Documents.
 - 4. Determination of accuracy and completeness of dimensions and quantities.
 - 5. Confirmation and coordination of dimensions and field conditions at Site.
 - 6. Construction means, techniques, sequences, and procedures.
 - 7. Safety precautions.
 - 8. Coordination and performance of Work of all trades.
- C. Stamp, sign or initial, and date each submittal to certify compliance with requirements of Contract Documents.

- D. Do not fabricate products or begin Work for which submittals are required until approved submittals have been received from Architect/Engineer.

1.13 ARCHITECT/ENGINEER REVIEW

- A. Do not make "mass submittals" to Architect/Engineer. "Mass submittals" are defined as six or more submittals or items in one day or 15 or more submittals or items in one week. If "mass submittals" are received, Architect/Engineer's review time stated above will be extended as necessary to perform proper review. Architect/Engineer will review "mass submittals" based on priority determined by Architect/Engineer after consultation with Owner and Contractor.
- B. Informational submittals and other similar data are for Architect/Engineer's information, do not require Architect/Engineer's responsive action, and will not be reviewed or returned with comment.
- C. Submittals made by Contractor that are not required by Contract Documents may be returned without action.
- D. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order, or Construction Change Directive.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality control.
- B. Tolerances.
- C. References.

1.2 QUALITY CONTROL

- A. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Perform Work using persons qualified to produce required and specified quality.
- D. Products, materials, and equipment may be subject to inspection by Architect/Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- E. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

1.3 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current as of date of permit except where specific date is established by code.
- C. Obtain copies of standards and maintain on Site when required by product Specification Sections.
- D. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

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- E. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference in reference documents.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Facilities:
 - 1. Temporary sanitary facilities.
 - 2. Field offices and sheds.
 - 3. Parking.
 - 4. Progress cleaning and waste removal.
 - 5. Fire-prevention facilities.
 - 6. Security.

1.2 TEMPORARY SANITARY FACILITIES

- A. Existing facilities may be used. Maintain a clean and sanitary condition daily.

1.3 FIELD OFFICES AND SHEDS

- A. Designated spaces may be used for field offices and for storage:

1.4 PARKING

- A. Use of designated areas of existing parking facilities used by construction personnel is permitted.

1.5 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces.
- C. Broom and vacuum clean interior areas before starting surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove waste materials, debris, and rubbish from Site periodically and dispose of off-Site.

1.6 FIRE-PREVENTION FACILITIES

- A. Prohibit smoking within buildings and on property.
- B. Establish fire watch for cutting, welding, and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.
- C. Portable Fire Extinguishers: NFPA 10; 10-pound capacity, 4A-60B: C UL rating.
 - 1. Provide one fire extinguisher at each stairway on each floor of buildings under construction.
 - 2. Provide minimum of one fire extinguisher in every construction trailer and storage shed.
 - 3. Provide minimum of one fire extinguisher on roof during roofing operations using heat-producing equipment.

1.7 SECURITY

A. Security Program:

1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.

B. Entry Control:

1. Allow entrance only to authorized persons with proper identification.
2. Follow campus security protocol for entering the building.
3. Coordinate access of Owner's personnel to Site in coordination with Owner's security forces.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Equipment electrical characteristics and components.

1.2 PRODUCTS

- A. At minimum, comply with specified requirements and reference standards.
- B. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- C. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- D. Do not use materials and equipment removed from existing premises except as specifically permitted by Contract Documents.
- E. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products according to manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.

- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide off-Site storage and protection when Site does not permit on-Site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Products complying with specified reference standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and complying with Specifications; no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions: Submit Request for Substitution for any manufacturer not named, according to Section 01 25 00 - Substitution Procedures.

PART 2 PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Include lugs for terminal box.
- B. Cord and Plug: Furnish minimum **6-foot** long cord and plug including grounding connector for connection to electric wiring system. Cord of longer length may be specified in individual Specification Sections.

PART 3 EXECUTION - Not Used

END OF SECTION

SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Starting of systems.
- C. Demonstration and instructions.
- D. Project record documents.
- E. Operation and maintenance data.
- F. Product warranties and product bonds.
- G. Maintenance service.
- H. Examination.
- I. Preparation.
- J. Execution.
- K. Cutting and patching.
- L. Protecting installed construction.

1.2 CLOSEOUT PROCEDURES

- A. Prerequisites to Substantial Completion: Complete following items before requesting Certification of Substantial Completion, either for entire Work or for portions of Work:
 - 1. Submit maintenance manuals, Project record documents, and other similar final record data in compliance with this Section.
 - 2. Complete facility startup, testing, adjusting, balancing of systems and equipment, demonstrations, and instructions to Owner's operating and maintenance personnel as specified in compliance with this Section.
 - 3. Conduct inspection to establish basis for request that Work is substantially complete. Create comprehensive list (initial punch list) indicating items to be completed or corrected, value of incomplete or nonconforming Work, reason for being incomplete, and date of anticipated completion for each item. Include copy of list with request for Certificate of Substantial Completion.
 - 4. Obtain and submit releases enabling Owner's full, unrestricted use of Project and access to services and utilities. Include certificate of occupancy, operating certificates, and similar releases from authorities having jurisdiction and utility companies.
 - 5. Deliver tools, spare parts, extra stocks of material, and similar physical items to Owner.
 - 6. Perform final cleaning according to this Section.
- B. Substantial Completion Inspection:
 - 1. When Contractor considers Work to be substantially complete, submit to Architect/Engineer:
 - a. Written certificate that Work, or designated portion, is substantially complete.
 - b. List of items to be completed or corrected (initial punch list).

2. Within seven days after receipt of request for Substantial Completion, Architect/Engineer will make inspection to determine whether Work or designated portion is substantially complete.
 3. Should Architect/Engineer determine that Work is not substantially complete:
 - a. Architect/Engineer will promptly notify Contractor in writing, stating reasons for its opinion.
 - b. Contractor shall remedy deficiencies in Work and send second written request for Substantial Completion to Architect/Engineer.
 - c. Architect/Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect/Engineer's inspection.
 4. When Architect/Engineer finds that Work is substantially complete, Architect/Engineer will:
 - a. Prepare Certificate of Substantial Completion on AIA G704 - Certificate of Substantial Completion or equivalent, accompanied by Contractor's list of items to be completed or corrected as verified and amended by Architect/Engineer and Owner (final punch list).
 - b. Submit Certificate to Owner and Contractor for their written acceptance of responsibilities assigned to them in Certificate.
 5. After Work is substantially complete, Contractor shall:
 - a. Allow Owner occupancy of Project under provisions stated in Certificate of Substantial Completion.
 - b. Complete Work listed for completion or correction within time period stipulated.
- C. Prerequisites for Final Completion: Complete following items before requesting final acceptance and final payment.
1. When Contractor considers Work to be complete, submit written certification that:
 - a. Contract Documents have been reviewed.
 - b. Work has been examined for compliance with Contract Documents.
 - c. Work has been completed according to Contract Documents.
 - d. Work is completed and ready for final inspection.
 2. Submittals: Submit following:
 - a. Final punch list indicating all items have been completed or corrected.
 - b. Final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - c. Specified warranties, workmanship/maintenance bonds, maintenance agreements, and other similar documents.
 - d. Accounting statement for final changes to Contract Sum.
 3. Perform final cleaning for Contractor-soiled areas according to this Section.
- D. Final Completion Inspection:
1. Within seven days after receipt of request for final inspection, Architect/Engineer will make inspection to determine whether Work or designated portion is complete.
 2. Should Architect/Engineer consider Work to be incomplete or defective:
 - a. Architect/Engineer will promptly notify Contractor in writing, listing incomplete or defective Work.
 - b. Contractor shall remedy stated deficiencies and send second written request to Architect/Engineer that Work is complete.
 - c. Architect/Engineer will reinspect Work.
 - d. Redo and Inspection of Deficient Work: Repeated until Work passes Architect/Engineer's inspection.

1.3 STARTING OF SYSTEMS

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Architect/Engineer seven days prior to startup of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.
- G. When specified in individual Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.
- H. Submit a written report according to Section 01 33 00 - Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

1.4 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate Project equipment and instructed by manufacturer's representative who is knowledgeable about the Project.
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- F. Required instruction time for each item of equipment and system is specified in individual Specification Sections.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain on Site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, product data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product Section, description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates used.
 - 3. Changes made by Addenda and modifications.

- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:
 - 1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
 - 2. Include locations of concealed elements of the Work.
 - 3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
 - 4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
 - 5. Identify and locate existing buried or concealed items encountered during Project.
 - 6. Measured depths of foundations in relation to finish first floor datum.
 - 7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 9. Field changes of dimension and detail.
 - 10. Details not on original Drawings.
- G. Submit marked-up paper copy documents to Architect/Engineer before Substantial Completion.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit in PDF composite electronic indexed file.
- B. Submit two copies of data bound in 8-1/2 x 11-inch text pages, three D side ring binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project.
- D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:
 - a. Operating instructions.
 - b. Maintenance instructions for equipment and systems.
 - c. Safety precautions to be taken when operating and maintaining or working near equipment.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop Drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.

1.7 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in by responsible Subcontractors, suppliers, and manufacturers within ten days after completion of applicable item of Work.

- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Submit prior to final Application for Payment.

1.8 MAINTENANCE SERVICE

- A. Refer to individual specification sections for requirements.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual Specification Sections.
- D. Verify that utility services are available with correct characteristics and in correct locations.

3.2 PREPARATION

- A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.3 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Architect/Engineer for final decision.
- E. Allow for expansion of materials and building movement.
- F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
- G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
1. Refer questionable mounting heights choices to Architect/Engineer for final decision.
 2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- H. Adjust operating products and equipment to ensure smooth and unhindered operation.
- I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

3.4 CUTTING AND PATCHING

- A. Employ skilled and experienced installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
1. Structural integrity of element.
 2. Integrity of weather-exposed or moisture-resistant elements.
 3. Efficiency, maintenance, or safety of element.
 4. Visual qualities of sight-exposed elements.
 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching to complete Work and to:
1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed Work.
 3. Remove and replace defective and nonconforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products according to requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduits, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

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- I. At penetrations of fire-rated walls, partitions, ceiling, or floor construction, completely seal voids with fire-rated material to full thickness of penetrated element.
- J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- K. Identify hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.

3.5 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Use durable sheet materials to protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

END OF SECTION

SECTION 01 91 00 - COMMISSIONING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Commissioning description.
 - 2. Submittals.
 - 3. Qualifications
 - 4. Commissioning services.
 - 5. Commissioning responsibilities.
 - 6. Commissioning meetings.
 - 7. Commissioning reports.
 - 8. Sequencing.
 - 9. Scheduling.
 - 10. Maintenance materials.
 - 11. Test equipment.
 - 12. Verification check and startup procedures.
 - 13. Functional performance test procedures.
 - 14. Function performance test methods.
 - 15. Deficiencies and test approvals.
 - 16. Demonstration.
- B. Related Sections:
 - 1. Section 23 08 00 - Commissioning of HVAC: Mechanical systems commissioning requirements.

1.2 REFERENCES

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE):
 - 1. ASHRAE Guideline 1 - The HVAC Commissioning Process.

1.3 COMMISSIONING DESCRIPTION

- A. Commissioning: Systematic process of ensuring systems perform interactively according to design intent and Owner's operational needs. Commissioning process encompasses and coordinates system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training, and verification of actual performance.
- B. Commissioning Intent:
 - 1. Verify equipment and systems are installed according to manufacturer's instructions, industry accepted minimum standards, and Contract Documents.
 - 2. Verify equipment and systems receive adequate operational checkout by Contractor.
 - 3. Verify and document proper performance of equipment and systems.
 - 4. Verify complete operation and maintenance documentation is delivered to Owner.
 - 5. Verify Owner's operating and maintenance personnel are adequately trained.
- C. Equipment and Systems to Be Commissioned: Refer to Section 23 08 00 - Commissioning of HVAC for equipment and system lists.

- D. Commissioning does not relieve Contractor of responsibility to provide finished and fully functioning Project.
- E. Commissioning Process Overview and General Order of Commissioning Tasks:
 - 1. Commissioning begins with initial commissioning meeting.
 - 2. Conduct progress commissioning meetings throughout construction to plan, scope, coordinate, and schedule future activities and to resolve problems.
 - 3. Commissioning Authority works with Contractor and equipment and system installers to develop startup plans and startup documentation formats, including verification.
 - 4. In general, checkout and performance verification proceeds from simple to complex, that is, from component level to equipment to systems and intersystem levels, with verification checklists being completed before functional testing.
 - 5. Equipment and system installers execute and document verification checklists and perform verification check and startup. Commissioning Authority verifies that checklists and startup were completed according to approved plans.
 - 6. Commissioning Authority develops specific equipment and system functional performance test procedures. Equipment and system installers review procedures.
 - 7. Equipment and system installers assist with procedures under direction of and documentation by Commissioning Authority.
 - 8. Items of noncompliance in material, installation, or setup are corrected at Contractor's expense, and system is retested.
 - 9. Commissioning Authority reviews operation and maintenance documentation for completeness.
 - 10. Commissioning is completed before Substantial Completion.
 - 11. Commissioning Authority reviews, approves, and coordinates training provided by equipment and system installers and verifies training was completed.
 - 12. Deferred testing is conducted as specified.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures contains requirements for submittals.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements contains requirements for closeout submittals.
- B. Operation and Maintenance Data: Submit operation and maintenance manuals as specified in individual equipment and system Specifications.
 - 1. Submittals made to Commissioning Authority do not constitute compliance with operation and maintenance manual documentation.
- C. Commissioning Record: Commissioning Authority will submit one electronic copy of commissioning record to the Owner. Furnish records in following format, arranged by system:
 - 1. Commissioning plan.
 - 2. Final commissioning report.
 - 3. System 1: Provide the following separated by tabbed flyleaves:
 - a. Design narrative and criteria, sequences, and approvals.
 - b. Startup plan and report, approvals, corrections, and blank verification checklists. Separate data for each equipment type with colored separators.
 - c. Completed, functional tests, trending and analysis, approvals and corrections, training plan, record and approvals, blank functional test forms, and recommended re-commissioning schedule.

4. System 2: As specified for System 1.

- D. Final Commissioning Report: Commissioning Authority will submit one electronic copy of final commissioning report including the following:
1. Executive summary with list and roles of participants, brief Project description, overview of commissioning and testing scope, and general description of testing and verification methods.
 2. For Each Piece of Commissioned Equipment: Include statement regarding compliance with Contract Documents in the following areas:
 - a. Equipment Specifications.
 - b. Equipment installation.
 - c. Functional performance and efficiency.
 - d. Equipment documentation and design intent.
 - e. Operator training.
 3. Include recommendations for improvement to equipment or operations, future actions, and commissioning process changes.
 4. List outstanding deficiencies referenced to specific functional test, inspection, trend log, or other record where deficiency is documented.
 5. Include brief description of verification method used as well as observations and conclusions from testing for each commissioned piece of equipment and system.

1.6 QUALITY ASSURANCE

- A. Perform Work according to ASHRAE Guideline 1.

1.7 COMMISSIONING SERVICES

- A. Owner will employ and pay for specified services of a Commissioning Authority.

1.8 COMMISSIONING RESPONSIBILITIES

- A. Responsibilities indicated for Owner, Architect/Engineer, and Commissioning Authority are provided only to clarify commissioning process.
- B. Architect/Engineer Responsibilities:
1. Clarify operation and control of commissioned equipment when Specifications, control drawings, or equipment documentation is not sufficient for writing detailed testing procedures.
 2. Coordinate resolution of design issues affecting system performance identified during commissioning.
 3. Coordinate resolution of system deficiencies identified during commissioning, according to Contract Documents.
 4. Prepare and submit final design intent documentation reflecting installed conditions for inclusion in operation and maintenance manuals.
 5. Review and approve operation and maintenance manuals.
- C. Commissioning Authority Responsibilities:
1. Basic Responsibilities:
 - a. Coordinate, direct, and approve commissioning Work.
 - b. Develop and coordinate execution of commissioning plan. Revise commissioning plan to suit Project conditions.
 - c. Schedule commissioning Work with Contractor for inclusion in Progress Schedule.
 - d. Plan and conduct commissioning meetings.

- e. Request and review commissioning submittals required to perform commissioning tasks.
 - f. Write and distribute verification tests and checklists.
 - g. Develop verification check and startup plan in cooperation with Contractor and equipment and system installers.
 - h. Write functional performance test procedures in cooperation with Contractor and equipment and system installers.
 - i. Review test and balance execution plan.
 - j. Attend selected Project meetings. Review meeting minutes. Resolve potential conflicts with commissioning activities.
 - k. Observe equipment and system installations.
 - l. Document that equipment and systems are installed and perform according to design intent and Contract Documents.
 - m. Notify Owner of deficiencies.
 - n. Coordinate and supervise required seasonal or deferred testing and deficiency corrections.
 - o. Oversee and approve content and adequacy of Owner's personnel training.
 - p. Review and approve operation and maintenance manuals.
 - q. Compile commissioning record and testing data manual.
 - r. Provide final commissioning report.
2. Detailed Responsibilities:
- a. Approve verification tests and checklist completion by reviewing verification checklist reports, Site observation, and spot checking.
 - b. Approve system startup by reviewing startup reports and Site observation.
 - c. Oversee functional testing of control system. Approve control system for use for test and balance operations.
 - d. Approve air and water system balancing by reviewing completed reports, Site observation, and spot testing.
 - e. Analyze functional performance trend logs and monitor data to verify performance.
 - f. Coordinate, witness, and approve manual functional performance tests performed by equipment and system installers.
 - 1) Coordinate retesting until satisfactory performance is achieved.
 - 2) Perform actual functional testing on equipment as specified in Section 23 08 00 - Commissioning of HVAC .
 - g. Maintain deficiency and resolution log and separate testing record. Submit progress reports and test results with recommended actions to Owner.
 - h. Review equipment warranties to ensure Owner's responsibilities are defined.
 - i. Return to Site minimum of two months before expiration of warranty period.
 - 1) Review with Owner's personnel the current equipment and system operation and condition of outstanding issues related to original and seasonal commissioning.
 - 2) Interview Owner's personnel to identify problems or concerns regarding equipment and system operation.
 - 3) Make suggestions for improvements and for recording changes in operation and maintenance manuals.
 - 4) Identify deficiencies covered by warranty or original construction contract.
 - 5) Assist Owner's personnel to develop reports, documents, and requests for services to remedy outstanding problems.
3. Commissioning Authority may not:
- a. Release, revoke, alter, or enlarge on requirements of Contract Documents.
 - b. Approve or accept any portion of the Work.
 - c. Assume duties of Contractor or Architect/Engineer.
 - d. Stop the Work.

- D. Owner Responsibilities:
 - 1. Arrange for Owner's personnel to attend commissioning activities and training sessions according to commissioning plan.
 - 2. Approve commissioning Work completion.
 - 3. Ensure seasonal or deferred testing and deficiency issues are addressed.
- E. Contractor Responsibilities:
 - 1. Include requirements for commissioning submittal data, operation and maintenance data, commissioning tasks and training in each purchase order and subcontract for equipment and systems indicated to be commissioned.
 - 2. Facilitate coordination of commissioning Work by Commissioning Authority.
 - 3. Attend commissioning meetings.
 - 4. Cooperate with Commissioning Authority, and provide access to the Work and to manufacturers' facilities.
 - 5. Require equipment and system installers to execute test to review and provide comments on functional test procedures.
 - 6. Furnish qualified personnel to assist in completing commissioning.
 - 7. Ensure equipment and system installers execute commissioning responsibilities according to Contract Documents and Progress Schedule.
 - 8. Coordinate Owner's personnel training.
 - 9. Prepare operation and maintenance manuals specified in Section 01 70 00 - Execution and Closeout Requirements. Update original sequences of operation reflecting actual installation.
 - 10. Ensure equipment and system installers execute seasonal and deferred functional performance testing, witnessed by Commissioning Authority.
 - 11. Ensure equipment and system installers correct deficiencies and make necessary adjustments to operation and maintenance manuals and record documents for issues identified in seasonal testing.

1.9 COMMISSIONING MEETINGS

- A. Section 01 30 00 - Administrative Requirements contains requirements for progress meetings.
- B. Commissioning Authority will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings. Meetings shall be via video conferencing.
- C. Initial Commissioning Meeting:
 - 1. Commissioning Authority will schedule meeting within 60 days after start of construction.
 - 2. Attendance Required: Commissioning Authority, Owner, Owner's facility personnel, Architect/Engineer, Contractor, Subcontractors, and testing, adjusting, and balancing agency. Require attendance by installers of the following equipment and systems indicated to be commissioned, including:
 - a. Temperature control equipment and systems.
 - 3. Agenda:
 - a. Review commissioning process and responsibilities.
 - b. Review commissioning plan development procedures.
 - c. Review required commissioning submittals.
 - d. Present initial commissioning schedule.
- D. Progress Commissioning Meetings:
 - 1. Commissioning Authority will schedule meetings throughout progress of the Work at maximum monthly intervals.
 - 2. Attendance Required: As specified for initial commissioning meeting.
 - 3. Agenda:
 - a. Coordination of commissioning activities.

- b. Commissioning deficiency resolution.
 - c. Commissioning schedule.
 - d. Planning for future commissioning activities.
- E. Commissioning Authority will record meeting minutes and distribute copies within seven days after meeting to participants and those affected by decisions made.

1.10 COMMISSIONING REPORTS

- A. Commissioning Authority Reports: Submit reports regularly to Owner, Architect/Engineer, and Contractor. Include the following.
 - 1. Progress reports.
 - 2. Scheduling changes.
 - 3. Observation reports of specific commissioning activities.
 - 4. Testing progress and approvals.
 - 5. Deficiencies and deficiency resolution reports.
- B. Commissioning Authority Functional Performance Test Procedures: Commissioning authority develops test procedures including forms with following information. Include completed documentation in operation and maintenance manuals.
 - 1. System and equipment or component names.
 - 2. Equipment location and identification number.
 - 3. Unique test identification number and reference to unique verification checklist and startup documentation identification numbers for piece of equipment.
 - 4. Date.
 - 5. Project name.
 - 6. Instructions for setting up test.
 - 7. Special cautions, alarm limits, and safety concerns.
 - 8. Specific step-by-step procedures to execute test, in clear, sequential, and repeatable format.
 - 9. Acceptance criteria of proper performance with "Yes/No" check box to allow for marking whether or not proper performance of each part of test was achieved.
 - 10. Section for comments.

1.11 SEQUENCING

- A. Section 01 10 00 - Summary contains requirements for sequencing.
- B. Sequence Work to complete commissioning, except for functional testing and Owner's personnel training, before Substantial Completion.
- C. Sequence Work to achieve functional completion before final completion. Complete the following for each piece of equipment and system indicated to be commissioned to achieve functional completion:
 - 1. Complete and sign startup and verification checklist documentation.
 - 2. Submit trend log data.
 - 3. Submit final approved test and balance report.
 - 4. Complete functional testing.
 - 5. Complete training of Owner personnel.
 - 6. Submit approved operation and maintenance data manuals.
 - 7. Correct identified deficiencies or obtain approval by Owner to exclude deficiencies from functional completion.

1.12 SCHEDULING

- A. Section 01 30 00 - Administrative Requirements contains requirements for scheduling.
- B. Schedule Work to allow adequate time for commissioning activities.
- C. Identify commissioning milestones, activities, and durations on Progress Schedule.
 - 1. Identify the following for each piece of equipment and system including:
 - a. Operation and maintenance manual submittal.
 - b. Verification check and startup.
 - c. Functional performance test.
 - d. Functional completion.
 - e. Demonstration and training sessions.
 - f. Commissioning completion.

PART 2 PRODUCTS

2.1 TEST EQUIPMENT

- A. Testing Equipment: Calibrated within last year; of sufficient quality and accuracy to test and measure system performance within the following tolerances unless otherwise specified for individual equipment or systems.
 - 1. Temperature Sensors and Digital Thermometers: 0.5 degrees F accuracy and plus or minus 0.1 degrees F resolution.
 - 2. Pressure Gauges: Accuracy of plus or minus 2.0 percent of measured value range.
- B. Equipment Furnished by Contractor and Remaining Property of Contractor:
 - 1. Standard testing equipment required to perform verification check and startup and required functional performance testing.
- C. Equipment furnished by Commissioning Authority and remaining property of Commissioning Authority:
 - 1. Data-logging equipment and software.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements contains requirements for verification of existing conditions before starting Work.
- B. Verify equipment and systems are installed according to individual Specification Sections.
- C. Verify utility and power connections are complete and services operational.

3.2 VERIFICATION CHECK AND STARTUP PROCEDURES

- A. Notify Commissioning Authority and schedule verification check and startup activities with each party required to complete verification check and startup a minimum of two weeks in advance.
- B. Allow Commissioning Authority to witness verification check and startup.

- C. Verification Check and Startup:
 - 1. Perform verification check and startup according to approved verification check and startup plan.
- D. Deficiencies and Approvals:
 - 1. Commissioning Authority will review verification check and startup reports and issue deficiency report or approval.
 - 2. Correct deficiencies and resubmit updated verification check and startup report with statement indicating corrections made for Commissioning Authority approval.
 - 3. Repeat process until verification check and startup report are approved.
 - 4. Costs for incomplete verification check and startup items that later cause deficiencies or delays during functional tests may be charged to party responsible for incomplete item.

3.3 FUNCTIONAL PERFORMANCE TEST PROCEDURES

- A. Complete the following before performing functional tests:
 - 1. Verification check and startup.
 - 2. Control system testing with approval by Commissioning Authority for use for test and balance operations.
 - 3. Air system balancing and water system balancing.
- B. Notify Commissioning Authority of completion of verification check and startup activities.
- C. Commissioning Authority will perform, and document results of functional performance tests. Contractor shall assist in tests that the Commissioning Authority cannot access or activate for testing.
- D. Commissioning Authority shall conduct functional performance tests as specified in Section 23 08 00 - Commissioning of HVAC.
- E. Commissioning Authority shall demonstrate that each piece of equipment and system is operating according to documented design intent and Contract Documents.
 - 1. Conduct testing proceeding from components, to subsystems, to systems.
 - 2. Bring equipment and systems to condition capable full dynamic operation.
 - 3. Verify performance of individual components and systems.
 - 4. Verify performance of interactions between systems.
 - 5. Identify and correct areas of deficient performance.
- F. Commissioning Authority shall operate each piece of equipment and system through each specified mode of operation including seasonal, occupied, unoccupied, warmup, cool-down, partial load, and full load conditions.
 - 1. Verify each sequence in sequences of operation.
 - 2. Test for proper responses to power failure, freezing, overheating, no flow, equipment failure, and other abnormal conditions.

3.4 FUNCTIONAL PERFORMANCE TEST METHODS

- A. Commissioning Authority shall perform testing and verification by using manual testing or by monitoring performance and analyzing results using control system trend log capabilities or by standalone data loggers as specified for each piece of equipment or system.
 - 1. Commissioning Authority may require alternate or additional method other than specified method.
 - 2. Commissioning Authority will determine test method when method is not specified.

- B. Simulated Conditions: Simulating conditions, not by overwritten values, is permitted. Timing tests to use real conditions is encouraged wherever practical.
- C. Overwritten Values: Overwriting sensor values to simulate conditions may be used with caution and avoided when possible.
- D. Simulated Signals: Using signal generator to create simulated signals to test and calibrate transducers automatic temperature controls is generally recommended over using sensors as signal generators with simulated conditions or overwritten values.
- E. Altering Setpoints: Rather than overwriting sensor values, and when simulating conditions is difficult, altering setpoints to test specific sequence is acceptable. Reset setpoint after completing test.
- F. Indirect Indicators: Using indirect indicators for responses or performance is permitted only after visually and directly verifying and documenting indirect readings through control system representing actual conditions and responses over tested parameter range.
- G. Perform each function and test under conditions simulating actual conditions as close as is practically possible.
 - 1. Provide materials, system modifications, and other items or steps necessary to produce flows, pressures, temperatures, and other responses to execute test according to specified conditions.
 - 2. At completion of test, return modified equipment and systems to pretest condition.
 - 3. When frequent failures occur, Commissioning Authority may stop testing and require responsible party to perform and document checkout of remaining units, prior to continuing with functional performance testing.

3.5 DEFICIENCIES AND TEST APPROVALS

- A. Deficiencies:
 - 1. Commissioning Authority will record and report deficiencies to Owner.
 - 2. Minor deficiencies may be corrected during tests at Commissioning Authority's discretion. Deficiency and resolution will be documented on procedure form.
 - 3. Failure to attend scheduled verification check, startup, or functional performance test will be considered deficiency.
 - 4. When deficiency is identified, Commissioning Authority will discuss issue with party executing test.
 - a. When party executing test accepts responsibility to correct deficiency:
 - 1) Commissioning Authority documents deficiency and executing party's response.
 - 2) Commissioning Authority submits deficiency report to Owner, and Contractor.
 - 3) Contractor corrects deficiency, signs statement of correction on deficiency form certifying equipment is ready for retesting, and submits form to Commissioning Authority.
 - 4) Commissioning Authority reschedules test, and test is repeated until satisfactory performance is achieved.
 - b. When party disputes deficiency or responsibility for deficiency:
 - 1) Commissioning Authority documents deficiency and party's response.
 - 2) Commissioning Authority negotiates resolution with parties involved and refers continuing disputes to Architect/Engineer for resolution according to Contract Documents.
 - 3) Commissioning Authority documents resolution process.

- 4) When resolution is decided, appropriate party corrects deficiency, signs statement of correction on deficiency form certifying equipment is ready for retesting, and submits form to Commissioning Authority.
 - 5) Commissioning Authority reschedules test, and test is repeated until satisfactory performance is achieved.
- B. Retesting Costs:
1. When verification check and startup or functional performance test deficiency is discovered requiring rescheduling or retesting:
 - a. Owner will compensate Commissioning Authority, for attending and directing additional testing after a second test.
 - b. Owner will deduct additional testing compensation from final payment due to Contractor.
- C. Manufacturing Defects: When 10 percent but not less than 3 identical pieces of equipment or equipment with only small size or capacity differences fail to perform to Contract Document requirements due to manufacturing defect, all identical units may be considered defective by Owner.
1. Within one week of notice from Owner, examine all other identical units and record findings. Submit findings to Owner within two weeks of original notice.
 2. Within two weeks of original notification, provide signed and dated written explanation of problem, cause of defect, and proposed solutions meeting Contract Document requirements. Include equipment submittals supporting solution.
 3. Owner will determine whether replacement or repair of all identical units is required.
 4. Install two examples of proposed solution. Owner will test installations for up to one week before deciding solution is acceptable.
 5. Upon acceptance, replace or repair all identical items, at Contractor's expense. Extend warranty accordingly, when original equipment warranty had begun.
 6. Complete repairs or replacements with reasonable speed beginning within one week from when parts can be obtained.
- D. Test Approval: Commissioning Authority notes each satisfactorily demonstrated function on functional performance test form.
1. Commissioning Authority recommends acceptance of each test to Owner using standard form.
 2. Owner gives final approval for each test using same form, providing signed copy to Commissioning Authority and Contractor.
- 3.6 DEMONSTRATION
- A. Section 01 70 00 - Execution and Closeout Requirements contains requirements for demonstration and training.
- B. Demonstrate equipment and systems and train Owner's personnel as specified in individual equipment and system Specifications.

END OF SECTION

SECTION 23 05 93 - TESTING AND BALANCING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Testing, adjusting, and calibration of variable air volume boxes, motorized dampers, variable speed fans and other devices.

1.2 REFERENCES

A. Associated Air Balance Council:

1. AABC MN-1 - National Standards for Testing and Balancing Heating, Ventilating, and Air Conditioning Systems.

B. American Society of Heating, Refrigerating and Air-Conditioning Engineers:

1. ASHRAE 111 - Practices for Measurement, Testing, Adjusting and Balancing of Building Heating, Ventilation, Air-Conditioning and Refrigeration Systems.

C. Natural Environmental Balancing Bureau:

1. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.

D. Testing Adjusting and Balancing Bureau:

1. TABB - International Standards for Environmental Systems Balance.

1.3 SUBMITTALS

A. Section 01 70 00 – Submittal Procedures: Submittal procedures.

B. Prior to commencing Work, submit proof of latest calibration date of each instrument.

C. Test Reports: Indicate data on forms containing information indicated in Schedules.

D. Field Reports: Indicate deficiencies preventing proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

E. Prior to commencing Work, submit report forms or outlines indicating adjusting, balancing, and equipment data required. Submit draft copies of report for review prior to final acceptance of Project.

F. Furnish reports in electronic format (PDF).

1.4 CLOSEOUT SUBMITTALS

A. Section 01 70 00 – Execution and Closeout Requirements: Closeout procedures.

B. Operation and Maintenance Data: Furnish final copy of testing, adjusting, and balancing report inclusion in operating and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with AABC MN-1 National Standards for Field Measurement and Instrumentation, Total System Balance; ASHRAE 111; NEBB Procedural Standards for

Testing, Balancing and Adjusting of Environmental Systems; or TABB International Quality Assurance program.

1.6 QUALIFICATIONS

- A. Agency: Company specializing in testing, adjusting, and balancing of systems specified in this section with minimum five years experience.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify systems are complete and operable before commencing work. Verify the following:
 - 1. Systems are started and operating in safe and normal condition.
 - 2. HVAC control systems are installed complete and operable.
 - 3. Final filters are clean and in place. 30 days prior to balancing, notify Owner to replace air filters.

3.2 PREPARATION

- A. Furnish instruments required for testing, adjusting, and balancing operations.
- B. Make instruments available to Architect/Engineer to facilitate spot checks during testing.

3.3 INSTALLATION TOLERANCES

- A. Adjust to within minus plus 10 percent of design.

3.4 ADJUSTING

- A. Verify recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock stops.
- C. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.
- D. Report defects and deficiencies noted during performance of services, preventing system balance.
- E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.5 AIR SYSTEM PROCEDURE

- A. Measure and calibrate airflow for the following devices with the controls installer.
 - 1. Variable air volume(VAV) boxes
 - 2. Rooftop Air Conditioning Units:
 - 3. Minimum outside air and damper position
 - 4. Air Handlers HVAC-1 and 2

Building Automation System Replacement
Classroom Building, York County Community College

- a. Minimum outside air and damper position
- b. Fan speed for supply fan design cfm
- c. Building pressure static pressure sensors calibration

3.6 SCHEDULES

A. Report Forms

- 1. Title Page:
 - a. Name of Testing, Adjusting, and Balancing Agency
 - b. Address of Testing, Adjusting, and Balancing Agency
 - c. Telephone and email Testing, Adjusting, and Balancing Agency
 - d. Project name
 - e. Project location
 - f. Project Engineer
 - g. Project Contractor
 - h. Report date
- 2. Instrument List:
 - a. Instrument
 - b. Calibration date

B. VAV Box

- 1. CFM
- 2. Calibration factor

C. Rooftop Air Conditioning Units

- 1. Minimum outside air and damper position

D. Air Handlers HVAC-1 and 2

- 1. Minimum outside air and damper position
- 2. Fan speed for supply fan design cfm
- 3. Building pressure static pressure sensors calibration

END OF SECTION

SECTION 23 07 00 - HVAC INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. HVAC piping insulation, jackets and accessories.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C450 - Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging.
 - 2. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation.
 - 3. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
 - 4. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation.
 - 5. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials.

1.3 SUBMITTALS

- A. Not required.

1.4 QUALITY ASSURANCE

- A. Comply with maximum flame spread index of 25 and maximum smoke developed index of not exceeding 450 in accordance with ASTM E84.
- B. Pipe insulation manufactured in accordance with ASTM C585 for inner and outer diameters.
- C. Factory fabricated fitting covers manufactured in accordance with ASTM C450.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Manufacturers; Glass Fiber and Mineral Fiber Insulation:
 - 1. CertainTeed Corporation.
 - 2. Johns Manville.
 - 3. Knauf Insulation.

2.2 PIPE INSULATION

- A. TYPE P-1: ASTM C547, molded glass fiber pipe insulation.
 - 1. Thermal Conductivity: 0.23 at 75 degrees F.
 - 2. Operating Temperature Range: 0 to 850 degrees F.
 - 3. Vapor Barrier Jacket: ASTM C1136, Type I, factory applied reinforced foil kraft with self-sealing adhesive joints.
 - 4. Jacket Temperature Limit: minus 20 to 150 degrees F.

2.3 PIPE INSULATION ACCESSORIES

- A. Vapor Retarder Lap Adhesive: Compatible with insulation.

- B. Covering Adhesive Mastic: Compatible with insulation.
- C. Piping 1-1/2 inches diameter and smaller: Galvanized steel insulation protection shield. MSS SP-69, Type 40. Length: Based on pipe size and insulation thickness.
- D. Fittings: PVC covers with stainless steel thumb tacks

PART 3 EXECUTION (Not Applicable)

3.1 INSTALLATION - PIPING SYSTEMS

- A. Hot Piping Systems greater than 140 degrees F
 1. Provide pipe insulation on existing pipe at control valves being replaced. Piping under fintube radiation enclosures do not require insulation. Provide pipe insulation in other locations as noted on the drawings.
 2. Furnish factory-applied or field-applied standard jackets. Secure with outward clinch expanding staples or pressure sensitive adhesive system on standard factory-applied jacket and butt strips or both.
 3. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.
 4. Insulate unions at equipment. Mark location of union on insulation cover.

3.2 SCHEDULES

A. Heating Services Piping Insulation Schedule:

PIPING SYSTEM	INSULATION TYPE	PIPE SIZE	INSULATION THICKNESS inches
Heating Water Supply and Return 141 to 200 degrees F	P-1	1-1/2 inches and smaller	1" to match existing

END OF SECTION

SECTION 23 08 00 - COMMISSIONING OF HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. HVAC commissioning description.
 - 2. HVAC commissioning responsibilities.
- B. Related Sections:
 - 1. Section 01 91 00 - Commissioning
 - 2. Section 23 05 93 - Testing, Adjusting, and Balancing for HVAC: For requirements and procedures concerning testing, adjusting, and balancing of mechanical systems.
 - 3. Section 23 09 23 - Direct-Digital Control System for HVAC: Submittal, training, and programming requirements.

1.2 REFERENCES

- A. American Society of Heating, Refrigerating and Air-Conditioning Engineers:
 - 1. ASHRAE Guideline 1 - The HVAC Commissioning Process.

1.3 COMMISSIONING DESCRIPTION

- A. HVAC commissioning process includes the following tasks:
 - 1. Testing and startup of HVAC equipment and systems.
 - 2. Equipment and system verification checks.
 - 3. Assistance in functional performance testing to verify testing and balancing, and equipment and system performance.
 - 4. Provide qualified personnel to assist in commissioning tests, including seasonal testing.
 - 5. Complete and endorse functional performance test checklists provided by Commissioning Authority to assure equipment and systems are fully operational and ready for functional performance testing.
 - 6. Provide equipment, materials, and labor necessary to correct deficiencies found during commissioning process to fulfill contract and warranty requirements.
 - 7. Provide operation and maintenance information and record drawings to Commissioning Authority for review verification and organization, prior to distribution.
 - 8. Provide assistance to Commissioning Authority to develop, edit, and document system operation descriptions.
 - 9. Provide training for systems specified in this Section with coordination by Commissioning Authority.
- B. Equipment and Systems to Be Commissioned:
 - 1. HVAC control systems that were installed under this Contract.
 - 2. Existing HVAC systems that were modified, adjusted, upgraded, or affected by the work performed under this Contract.
 - 3. Existing kitchen hood exhaust and makeup air systems.
 - 4. Fume hood exhaust systems
 - 5. Existing ductless split systems
- C. The following is a list of equipment that may be included in this HVAC Commissioning:
 - 1. Pumps.

2. Boilers.
3. Variable frequency drives.
4. Split system air conditioning units.
5. Air handling units.
6. Hot water terminal heating equipment.
7. Gas and hot water unit heaters.
8. Fans.
9. Fume hoods.
10. Building pressure
11. Kitchen hood supply systems.
12. Kitchen hood exhaust systems.
13. Automatic HVAC control system.
14. Testing, Adjusting and Balancing work.

- D. Perform seasonal function performance tests for the following equipment and systems:
1. Heating equipment during heating season.
 2. Cooling equipment during cooling season.

1.4 COMMISSIONING SUBMITTALS

- A. Section 01 91 00 - Commissioning: Requirements for commissioning submittals.
- B. Draft Forms: Commissioning Authority shall submit draft of system verification form and functional performance test checklist.
- C. Field Reports: Commissioning Authority shall indicate deficiencies preventing completion of equipment or system verification checks equipment or system to achieve specified performance.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for submittals.
- B. Project Record Documents: Record revisions to equipment and system documentation necessitated by commissioning.
- C. Operation and Maintenance Data: Submit revisions to operation and maintenance manuals when necessary revisions are discovered during commissioning.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with ASHRAE Guideline 1 requirements.

1.7 COMMISSIONING RESPONSIBILITIES

- A. Temperature Controls Installer Commissioning Responsibilities:
1. Attend commissioning meetings via video conferencing.
 2. Review design for ability of systems to be controlled including the following:
 - a. Confirm proper hardware requirements exists to perform functional performance testing.
 - b. Confirm proper safeties and interlocks are included in design.
 - c. Confirm proper sizing of system control valves and actuators and control valve operation will result capacity control identified in Contract Documents.
 - d. Confirm proper sizing of system control dampers and actuators and damper operation will result in proper damper positioning.

- e. Confirm sensors selected are within device ranges.
 - f. Review sequences of operation and obtain clarification from Architect/Engineer.
 - g. Indicate delineation of control between packaged controls and building automation system, listing BAS monitor points and BAS adjustable control points.
 - h. Provide written sequences of operation for packaged controlled equipment. Equipment manufacturers' stock sequences may be included, when accompanied by additional narrative to reflect Project conditions.
 - 3. Inspect, check, and confirm proper operation and performance of control hardware and software provided in other HVAC sections.
 - 4. Submit proposed procedures for performing automatic temperature control system point-to-point checks to Commissioning Authority and Architect/Engineer.
 - 5. Inspect check and confirm correct installation and operation of automatic temperature control system input and output device operation through point-to-point checks.
 - 6. Perform training sessions to instruct Owner's personnel in hardware operation, software operation, programming, and application in accordance with commissioning plan and requirements of Section 23 09 00.
 - 7. Demonstrate system performance and operation to Commissioning Authority during functional performance tests including each mode of operation.
 - 8. Provide control system technician to assist during Commissioning Authority verification check and functional performance testing.
 - 9. Provide control system technician to assist testing, adjusting, and balancing agency during performance of testing, adjusting, and balancing work.
 - 10. Assist in performing operation and maintenance training sessions scheduled by Commissioning Authority.
 - 11. Commissioning Authority will perform most of the tests without Contractor assistance. Commissioning Authority shall have access to the building management system for testing. Provide an allowance of 16 hours to assist the Commissioning Authority in performing tests.
- B. Testing, Adjusting, and Balancing Agency Commissioning Responsibilities:
- 1. Attend commissioning meetings.
 - 2. Participate in verification of testing, adjusting, and balancing report for verification or diagnostic purposes. Repeat sample of 10 percent of measurements contained in testing, adjusting, and balancing report.
- 1.8 COMMISSIONING MEETINGS
- A. Section 01 91 00 - Commissioning: Requirements for commissioning meetings.
- B. Attend initial commissioning meeting and progress commissioning meetings as required by Commissioning Authority. Meetings shall be by video conferencing.
- 1.9 SCHEDULING
- A. Section 01 30 00 - Administrative Requirements: Requirements for scheduling.
- B. Prepare schedule indicating anticipated start dates for the following:
- 1. Automatic temperature control system checkout.
 - 2. Testing, adjusting, and balancing.
 - 3. HVAC system orientation and inspections.
 - 4. Operation and maintenance manual submittals.
 - 5. Training sessions.

- C. Commissioning Authority shall schedule and perform seasonal tests of equipment and systems during peak weather conditions to observe full-load performance.

1.10 COORDINATION

- A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.
- B. Notify Commissioning Authority minimum of two weeks in advance of the following:
 - 1. Scheduled equipment and system startups.
 - 2. Scheduled automatic temperature control system checkout.
 - 3. Scheduled start of testing, adjusting, and balancing work.
- C. Coordinate programming of automatic temperature control system with construction and commissioning schedules.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Place HVAC systems and equipment into full operation and continue operation during each working day of commissioning.
- B. Prior to start of functional performance test, Owner shall install replacement filters in equipment.

3.2 FIELD TESTS AND INSPECTIONS BY COMMISSIONING AUTHORITY

- A. Seasonal Sensitive Functional Performance Tests:
 - 1. Test heating equipment at winter design temperatures.
 - 2. Test cooling equipment at summer design temperatures.

END OF SECTION

SECTION 23 09 23 – BUILDING AUTOMATION SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes direct-digital control system equipment and software for a complete building automation system (BAS).
- B. Related Sections:
 - 1. Section 01 10 00 - Summary for list of alternates.
 - 2. Section 01 91 00 - Commissioning
 - 3. Section 23 08 00 - Commissioning of HVAC: Mechanical systems commissioning requirements.

1.2 REFERENCES

- A. American National Standards Institute: ANSI MC85.1 - Terminology for Automatic Control
- B. American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. (ASHRAE), ASHRAE 2023, Applications Handbook, SI Edition.

1.3 SYSTEM DESCRIPTION

- A. Furnish and install a complete Building Automation System (BAS) consisting of a direct-digital temperature control and monitoring system with I/O operator devices, web interface, controllers, sensors, valves, dampers, damper motors, relays, control cabinet, etc. to perform the existing functions and the existing sequence of operations except as noted. Reuse existing devices and wiring where possible.
- B. Automatic temperature controls, field monitoring, and control system using application-specific configurable micro-processor-based units.
- C. Base system on a distributed system of fully intelligent, stand-alone controllers, operating in a multi-tasking, with central and remote hardware, software, and interconnecting wire and conduit.
- D. Provide computer software and hardware, operator input/output devices, control units, local area networks (LAN), sensors, control devices, and actuators.
- E. Provide installation and calibration, supervision, adjustments, and fine tuning necessary for complete and fully operational system.
- F. The Contractor shall provide electrical control and interlock wiring connected to the controls and instrumentation systems. Conduits in connection with the controls and instrumentation system shall be furnished and installed by this Section.
- G. Provide operator and technician-training program as described herein.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate the following:
 - 1. Provide schematic drawings showing the system architecture with point-to-point wiring
 - 2. Identify the location of each control panel in the building.

3. Indicate which piece of equipment is associated with each controller.
4. For terminal unit controllers, provide a schedule of equipment tag, room number, address of the controller, and information required for proper service.
5. Submit a wiring diagram for each electrical control device showing that the system has been coordinated to work and function as one.
6. Complete bill of materials, valve schedule and damper schedule
7. Sequence of operation
8. Drawings shall be 11"x17" or as approved by Engineer.

C. Product Data:

1. Submit data for each system component including installation and startup information.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Record actual locations of control components, including control units, thermostats, and sensors.

1. Revise shop drawings to reflect actual installation and operating sequences.
2. Submit data specified in "Submittals" in final "Record Documents" form.

C. Operation and Maintenance Data:

1. Submit interconnection wiring diagrams complete field installed systems with identified and numbered, system components and devices.
2. Final approved submittals
3. Maintenance instructions for each type of control device
4. Software operating manuals
5. Copy of device settings and device address list

1.6 QUALIFICATIONS

A. Installer: Company specializing in performing HVAC work.

1.7 QUALITY STANDARDS

A. Digital controllers and systems - UL Standard 916, Category PAZX (Energy Management standard)

B. Control components using voltages > 24VAC Nominal voltage – UL Standard 873 (Temperature Indicating and Regulating)

C. Control components using voltages < = 24VAC Nominal voltage – UL 873 or UL Component recognized (ULR)

D. FCC Part 15, Sub-Part A

E. Embedded IOT controller shall be able to communicate with Modbus devices.

1.8 WARRANTY

A. Section 01 70 00 - Execution and Closeout Requirements Product warranties.

B. Manufacturer and installer agree to repair or replace products that fail in workmanship or materials with the specified warranty period of three years for parts from DDC manufacturer and one year warranty for other parts and labor. Warranty period starts at Substantial Completion.

1.9 MAINTENANCE SERVICE

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for maintenance service.
- B. Furnish service and maintenance of control systems for one year from Date of Substantial Completion.
- C. Furnish complete service of controls systems, including callbacks. Make minimum of 2 complete normal inspections of approximately 4 hours duration in addition to normal service calls to inspect, calibrate, and adjust controls. Submit written report after each inspection.
- D. Furnish two complete inspections per year, one in each season, to inspect, calibrate, and adjust controls.
- E. Include systematic examination, controls checkout and adjustments. Repair or replace parts in accordance with manufacturer's operating and maintenance data. Use parts produced by manufacturer of original equipment.
- F. Perform work without removing units from service during building normal occupied hours.
- G. Perform maintenance work using competent and qualified personnel.

PART 2 PRODUCTS

2.1 DIRECT DIGITAL CONTROL (DDC) SYSTEM

- A. Manufacturers: Subject to compliance with the requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Proton

2.2 DDC SYSTEM DESCRIPTION:

- A. Provide control products in sizes and capacities as required, conforming with the manufacturer's standard materials and components, designed and constructed as recommended by the manufacturer, and as required to meet the sequence of operation. Refer to Point List in Part 3 of this section.
- B. The communicating control system shall use an open communication protocol.
- C. Provide software and communication interfaces to configure the system through a computer or a mobile device (smartphone or tablet).
- D. Systems shall be capable of operating with a low-voltage (24 VAC) power supply, fully protected with fuses.
- E. Controllers
 - 1. Controllers shall use screw type terminals for termination of individual wires.
 - 2. Control system shall be able to control and monitor equipment, collect trends, and manage alarms.
 - 3. The control system shall consist of a Network Controller and application-specific controllers to control equipment.

2.3 NETWORKING/COMMUNICATIONS

- A. The design of the control system shall be networked. The highest-level networking shall use TCP/IP Ethernet port and sub-level networking shall use serial communications.
- B. The highest level of communication shall be capable of direct connection or communication through local area network (LAN) or wide area network (WAN) utilizing an Ethernet connection.
- C. Network design shall include the following provisions: Support up to 127 devices. No limitation in device types for unitary and terminal controllers. Use RS-485 communication (Modbus RTU or BACnet MS/TP).
- D. The system shall permit the addition of controllers up to a maximum of 127 devices per network.
- E. The failure of any single component shall not interrupt the execution of the operational devices in the system.
- F. Provide serial communications ports on all terminal unit controllers to communicate with the control system.
- G. The Network Controller shall oversee the HVAC control network and it shall have the ability to collect and distribute network variables to terminal or unitary controllers.

2.4 NETWORK CONTROLLER

- A. The Network controller shall be microprocessor-based, multi-tasking, multi-user and digital control processors. It shall have the following features:
 - 1. Provide remote access to the control system via a network IP controller while linking unitary controllers together. The control system shall be accessed through the following: LAN network, local computer station, local temporary access (adaptor), remote via internet, or mobile device application.
 - 2. Perform overrides on the system.
 - 3. Create and distribute schedules to unitary controllers and terminal controllers on the network.
 - 4. Configure up to 16 schedules and yearly holiday calendars.
 - 5. Provide remote access.
 - 6. An internal clock.

2.5 APPLICATION-SPECIFIC CONTROLLERS (ASC)

A. General:

- 1. Equipment and terminal units shall be controlled using application-specific controllers or configurable to match the operation of the controlled HVAC equipment.
- 2. The ASC shall have 9 universal inputs, 5 digital outputs, and 3 analog outputs. Each output shall have hand/off/auto switches for testing purposes and manual overrides. Each ASC shall have an embedded time clock, and it shall have the capability of configuring its own schedule

B. Rooftop Controller

- 1. The central air handling unit controller shall be managed according to the demands of the zones and their voting weights. The voting weight of each zone shall be adjustable onsite. This controller shall control up to four (4) stages of cooling, two (2) stages of heating and one (1) modulating heating stage (SCR or hot water valve), complete with a minimum supply

temperature setpoint. The supply and return temperature sensors shall protect the unit from high or low temperatures.

2. The central air handling unit controller shall control the fresh air damper for cooling, following an embedded economizer sequence for free cooling. The damper shall remain at its minimal position (adjustable) during occupied hours and shall remain closed during unoccupied hours. The same controller shall also have an input for air quality (CO₂), which shall modulate the fresh air damper to maintain air quality at the desired level (adjustable) while optimizing the unit's performance.
3. The central air handling unit controller shall regulate the system's static pressure with a pressure transducer located downstream from the unit. The controller shall maintain a constant static pressure through means of an actuated bypass damper or a variable frequency drive controlling the unit's supply fan.
4. A proof of fan operation shall be required.
5. Controller shall have the following features:
 - a. 2 heating stages heating or one modulating heat control
 - b. 2 stages of cooling or one modulating cooling control (four stages with additional controller)
 - c. Variable frequency drive
 - d. Demand Control Ventilation (DCV)
 - e. Humidity control (Hot Gas Bypass)
 - f. Economizer
 - g. Minimum supply temperature setpoint
 - h. Fan proof
 - i. Supply temperature sensor
 - j. Return temperature sensor

C. Boiler Controller: It shall have the ability to control:

1. Staged or modulating boilers
2. Pumps in a primary/secondary configuration
3. Pumps in a duty/standby configuration with lead/lag and periodic rotation features
4. Supply water temperature based on an outside reset

D. General Purpose Configurable Input/Output Controller

1. When an application-specific controller is not available, a non-programmable, but configurable controller shall be provided.
2. The controller shall have the following:
 - a. Configurable using a computer software or phone app.
 - b. Offer output binding capabilities
 - c. Offer proportional or differential control on every output.
 - d. Control output logics based on network variables.
 - e. The configurable controller shall have 9 universal inputs, 5 digital outputs and 3 analog outputs. Each output shall have Hand/Off/Auto switches for testing purposes and manual overrides. Each ASC shall have an embedded time-clock, and it shall have the capability of configuring its own schedule.

2.6 ZONE CONTROLLERS (VAV or Fan Coil/FC)

- A. Zone controllers shall be configurable to match the operation of the desired HVAC equipment and function standalone or in a network. The zone controllers shall have an embedded actuator with automatic reset and shall self-calibrate the damper's blade stroke. If the damper stalls, a visual alert shall appear on the system's graphical user interface (GUI). Each zone controller shall possess one (1) analog output and one (1) or four (4) digital outputs (according to model). Each output shall be configurable to one of the following logics (adjustable): modulating, pulsed or on-

off. When the controller is used with a terminal heating coil, upon a heating demand, the controller shall reposition the actuator to supply the required air flow (adjustable) for the heating coil's adequate operation. Once the zone is satisfied, the actuator shall return to its minimal position (adjustable).

B. VAV Controller: It shall have the ability to control:

1. Pressure-dependent or independent zone dampers
2. Baseboard heat
3. Zone valve
4. Reheat coil
5. Fan coil controller shall have the ability to control:
 - A. 2-pipe configuration
 - B. Multi-speed fan
6. Thermostat shall have the ability to control:
 - a. Baseboard and reheat coil

C. Room Sensor/Thermostat/User Interface: The user interface (wall sensor) shall be digital, complete with setpoints and temperature indications. The adjustment range for the heating and cooling setpoints shall be limited (adjustable)

2.7 SOFTWARE

A. Provide software to form a complete operating system as described in this specification. Software shall be used to configure application-specific controllers and general-purpose configurable controllers. The system manufacturer shall provide the necessary hardware and software to communicate with the control system.

B. General

1. Software shall be available without any costs.
2. Software shall not have any licensing fees or requirements.
3. The software shall offer built-in graphics that self-adapt to the settings
4. Software shall be available through a computer or app.
5. Software shall offer optional remote connection capabilities.

C. Remote connection access shall be offered using the following methods:

1. TCP/IP connection.
2. Cloud communication.

D. Software login

1. Computer software shall have method to access controllers if physical access is permitted.
2. Projects stored on the Cloud service shall be accessible by users who have an account.
3. Owner shall be able to grant or remove user access.
4. Owner shall be able to choose the level of access of each user.

E. Software display

1. Controller names shall be changeable through the software
2. Controller icons shall have a color scheming to indicate whether controllers are communicating successfully.

F. Controller configuration

1. Controllers shall be configurable through software.
2. Controller parameters shall be available through computer software and app.
3. Limits, setpoints, and delays shall be adjustable.

G. Alarms

1. Alarms shall be sent through e-mail or push notifications to mobile devices.
2. Alarms shall be configurable through the software.

2.8 HVAC CONTROL PROGRAMS

- A. Programs shall match existing sequences of operation.

2.9 SENSORS

- A. Reuse existing sensors where possible.

2.10 CONTROL VALVES

A. Ball valves:

1. Threaded ends for 2-way valves 3 inches and smaller
2. Forged brass body, chrome plated brass ball and blowout proof stem and EPDM O-rings with minimum 600 psig (4135 kPa) rating.
3. Fluid Temperature Range: minus 20 to 250 degrees F (minus 29 to 121 degrees C).
4. Sizing: Cv and size as noted on drawings.
5. Flow Characteristics: Furnish 2-way valves with equal percentage characteristics.
6. Size 2-way valve actuators to close valves against pump shut off head.

2.11 CONTROL VALVE ACTUATORS

- A. Manufacturer: Belimo, match existing.
- B. Fully factory assembled. Size to operate with sufficient reserve power to provide smooth modulating action or two-position action under every condition.
- C. Motor: Permanent split-capacitor or shaded-pole type. Gear trains completely oil immersed and sealed. Furnish spring-return motors with integral spiral-spring mechanism in housings designed for easy removal for service or adjustment of limit switches, auxiliary switches, or feedback potentiometer.
- D. Actuator: Direct-coupled type non-hydraulic designed for minimum 100,000 full-stroke cycles at rated torque. Furnish actuator with rating of not less than twice thrust needed for actual operation of valve.
- E. Size for torque required for valve close-off at maximum pump differential pressure, regardless of water loop system pressures.

2.12 SMOKE DETECTORS

- A. Reuse existing smoke detectors.

2.13 RELAYS

- A. Electro mechanical control relays shall be plug-in type, and shall have dust cover and LED "energized" indicator. Contact rating, configuration, and coil voltage shall be suitable for application.
- B. Time delay relays shall be solid-state plug-in type, and shall have adjustable time delay. Delay shall be adjustable $\pm 100\%$ from set-point shown. Contact rating, configuration, and coil voltage shall be suitable for application.
- C. Unless implemented in control software, override timers shall be spring-wound line voltage, with contact rating and configuration required by application.

2.14 CONTROL PANEL ENCLOSURES

- A. Furnish for each system under automatic control with relays and controls mounted in cabinet and temperature indicators, pressure gages, pilot lights, push buttons and switches flush on cabinet panel face.
- B. Construction: NEMA 250, Type 1, 18 gage, steel enclosure.
- C. Covers: Continuous hinge, held closed by flush latch operable by screwdriver.
- D. Enclosure Finish: Manufacturer's standard enamel.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.
- B. Verify field end devices, and wiring are installed.

3.2 INSTALLATION

- A. The contractor shall provide labor, material, engineering, and software required to complete the installation and startup of the automation system.
- B. Electric work required as an integral part of the automation system is the responsibility of the contractor unless otherwise specified
- C. Work and materials shall conform to the latest edition of the National Electrical Code.
- D. Install the control system and materials in accordance with the manufacturer's written instructions.
- E. Control panels serving equipment fed by emergency power shall also be served by emergency power.
- F. Controllers shall be located as indicated on plans or coordinate with Owner.
- G. Wiring:
 - 1. Network wiring: Communication wiring shall be done using #24/2 wire, twisted and shielded, low capacitance grounded at the control cabinet, max length 3200ft (1000m) per segment.

2. Room sensors wiring: Room sensors wiring to their zone controller shall be a 4-wire cable (#22/4 shielded cable recommended)
 3. 24 VAC shall be provided to the controllers.
- H. Install control units and other hardware in position on permanent walls where not subject to excessive vibration.
- I. Install software in control units. Implement features of programs to match existing sequence of operation.
- J. Cable and wiring for the BAS system shall be concealed except in mechanical areas where it shall be protected by metallic raceways.
- K. Concealed cable in accessible ceiling, stud walls, crawl space, etc., may be plenum rated, low voltage cable. Cable in ceiling spaces shall not interfere with the removal of ceiling tiles or light fixtures and shall be run in a workmanlike manner firmly secured regularly to building structures. It shall not drape across the ceiling or be suspended from other system components such as ductwork, pipe or electrical conduit runs.
- L. Route wires and conduits parallel and perpendicular to walls and structure.
- M. Parallel cable systems shall be bundled and identified.

3.3 FIELD QUALITY CONTROL

A. Startup

1. Verify for proper 24 VAC polarity before startup.
 2. 24 Vac power supply must show 24 Vac to the ground.
 3. Ground terminal must show 0 Vac to earth ground
 4. Communication of controllers must be connected in an open daisy-chain.
- B. Termination and biasing resistors must be set according to the manufacturer's specifications.
- C. Start equipment to confirm proper operation.
- D. Test and adjust controls and safeties. Adjust PID loops.
- E. Test each control point through its operating range and for compliance with the sequence of operation.
- F. Test hardware and software interlocks.
- G. System Acceptance: Satisfactory completion is when the required testing to demonstrates performance compliance with the requirements of the Contract Documents. System acceptance shall be contingent upon completion and review of corrected deficiencies.
- H. Refer to Section 01 91 00 – Commissioning and Section 23 08 00 - Commissioning of HVAC for commissioning requirements with Commissioning Agent.

3.4 DEMONSTRATION AND TRAINING

- A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for demonstration and training.

B. Furnish basic operator training for 2 people on data display, alarm and status descriptors, and execution commands. Include a minimum of 8 hours instructor time. Furnish training on-site or at a training facility within two hours of job site.

C. Review equipment and device locations with Owner.

3.5 POINT LIST

POINT LIST					
SYSTEM POINT DESCRIPTION	ANALOG INPUT	ANALOG OUTPUT	BINARY INPUT	BINARY OUTPUT	NOTES
Existing Control Points:					
RTU-A1 Rms 208/208A/223 - ExFans (109)					
RTU~A1 SAF A	X				
RTU~A1 SAT	X				
RTU~A1 MAT	X				
RTU~A1 RAT	X				
RTU~A1 RA RH	X				
RTU~A1 RA CO2	X				
RMT~208	X				
RTU~A1 MAD		X			
RTU~A1 Duct Smk			X		
RTU~A1 Clogged AF			X		
RTU~A1 SAF Ena				X	
RTU~A1 Clg1 Ena				X	
RTU~A1 Htg1 Ena				X	
Mis Rm EF				X	
General EFs				X	
RTU-A2 Rms 217/218/220/222 (118)					
RTU~A2 SAF A	X				
RTU~A2 SAT	X				
RTU~A2 MAT	X				
RTU~A2 RAT	X				
RTU~A2 RA RH	X				
RTU~A2 RA CO2	X				
RMT~219	X				
RMT~218	X				
Stair 1 Temperature	X				

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RMT~217	X				
RTU~A2 MAD		X			
RTU~A2 Duct Smk			X		
RTU~A2 Clogged AF			X		
RTU~A2 SAF Ena				X	
RTU~A2 Clg1 Ena				X	
RTU~A2 Htg1 Ena				X	
RTU~A2 Htg2 Ena				X	
RTU-A3 Rm 120 (106)					
RTU~A3 SAF A	X				
RTU~A3 SAT	X				
RTU~A3 MAT	X				
RTU~A3 RAT	X				
RTU~A3 RA RH	X				
RTU~A3 RA CO2	X				
RMT~120	X				
RTU~A3 MAD		X			
RTU~A3 Duct Smk			X		
RTU~A3 Clogged AF			X		
RTU~A3 SAF Una				X	
RTU~A3 Clg1 Ena				X	
RTU~A3 Htg1 Ena				X	
RTU-A4 Rms 225-227 (103)					
RTU~A4 SAF A	X				
RTU~A4 SAT	X				
RTU~A4 MAT	X				
RTU~A4 RAT	X				
RTU~A4 RA RH	X				
RTU~A4 RA CO2	X				
RMT~225	X				
RMT~227	X				
RTU~A4 MAD		X			
RTU~A4 Duct Smk			X		
RTU~A4 Clogged AF			X		
RTU~A4 SAF Ena				X	
RTU~A4 Clg1 Ena				X	
RTU~A4 Htg1 Ena				X	
RTU-A5 Rms 210/212 (113)					
RTU~A5 SAF A	X				
RTU~A5 SAT	X				
RTU~A5 MAT	X				
RTU~A5 RAT	X				
RTU~A5 RA RH	X				
RTU~A5 RA CO2	X				
RMT~212	X				
RMT~210	X				
RTU~A5 MAD (No Economizer)		X			

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RTU~A5 Duct Smk			X		
RTU~A5 Clogged AF			X		
RTU~A5 SAF Ena				X	
RTU~A5 Clg1 Ena				X	
RTU~A5 Htg1 Ena				X	
RTU-A6 Rms 214/216 (116)					
RTU~A6 SAF A	X				
RTU~A6 SAT	X				
RTU~A6 MAT	X				
RTU~A6 RAT	X				
RTU~A6 RA RH	X				
RTU~A6 RA CO2	X				
RMT~214	X				
RMT~216	X				
RTU~A6 MAD		X			
RTU~A6 Duct Smk			X		
RTU~A6 Clogged AF			X		
RTU~A6 SAF Ena				X	
RTU~A6 Clg1 Ena				X	
RTU~A6 Htg1 Ena				X	
RTU-B1 Rm 117 (105)					
RTU~B1 SAF A	X				
RTU~B1 SAT	X				
RTU~B1 MAT	X				
RTU~B1 RAT	X				
RTU~B1 RA RH	X				
RTU~B1 RA CO2	X				
RMT~117	X				
RTU~B1 MAD		X			
RTU~B1 Duct Smk			X		
RTU~B1 Clogged AF			X		
RTU~B1 SAF Ena				X	
RTU~B1 Clg1 Ena				X	
RTU~B1 Htg1 Ena				X	
RTU-B2 Rms 231-231C (101)					
RTU~B2 SAF A	X				
RTU~B2 SAT	X				
RTU~B2 MAT	X				
RTU~B2 RAT	X				
RTU~B2 RA RH	X				
RTU~B2 RA CO2	X				
RMT~233	X				
RMT~235	X				
RMT~231	X				
RTU~B2 MAD		X			
RTU~B2 Duct Smk			X		
RTU~B2 Clogged AF			X		

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RTU~B2 SAF Ena				X	
RTU~B2 Clg1 Ena				X	
RTU~B2 Htg1 Ena				X	
RTU~B2 Htg2 Ena				X	
RTU-B3 Rms 101/101C (107)					
RTU~B3 SAF A	X				
RTU~B3 SAT	X				
RTU~B3 MAT	X				
RTU~B3 RAT	X				
RTU~B3 RA RH	X				
RTU~B3 RA CO2	X				
RMT~101C	X				
RMT~101	X				
RTU~B3 MAD		X			
RTU~B3 Duct Smk			X		
RTU~B3 Clogged AF			X		
RTU~B3 SAF Ena				X	
RTU~B3 Clg1 Ena				X	
RTU~B3 Htg1 Ena				X	
RTU~B3 Htg2 Ena				X	
RTU-B4 Rm 207/209 (115)					
RTU~B4 SAF A	X				
RTU~B4 SAT	X				
RTU~B4 MAT	X				
RTU~B4 RAT	X				
RTU~B4 RA RH	X				
RTU~B4 RA CO2	X				
RMT~209	X				
RMT~207	X				
RTU~B4 MAD		X			
RTU~B4 Duct Smk			X		
RTU~B4 Clogged AF			X		
RTU~B4 SAF Ena				X	
RTU~B4 Clg1 Ena				X	
RTU~B4 Htg1 Ena				X	
RTU-B5 Rm 101G-105 (111)					
RTU~B5 SAF A	X				
RTU~B5 SAT	X				
RTU~B5 MAT	X				
RTU~B5 RAT	X				
RTU~B5 RA RH	X				
RTU~B5 RA CO2	X				
RMT~105	X				
RMT~101G	X				
RTU~B5 MAD		X			
RTU~B5 Duct Smk			X		
RTU~B5 Clogged AF			X		

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RTU~B5 SAF Ena				X	
RTU~B5 Clg1 Ena				X	
RTU~B5 Htg1 Ena				X	
RTU-C1 Rms 108/110 (110)					
RTU~C1 SAF A	X				
RTU~C1 SAT	X				
RTU~C1 MAT	X				
RTU~C1 RAT	X				
RTU~C1 RA RH	X				
RTU~C1 RA CO2	X				
RMT~110M	X				
RMT~108	X				
RTU~C1 MAD		X			
RTU~C1 Duct Smk			X		
RTU~C1 Clogged AF			X		
RTU~C1 SAF Ena				X	
RTU~C1 Clg1 Ena				X	
RTU~C1 Clg2 Ena				X	
RTU~C1 Htg1 Ena				X	
RTU~C1 Htg2 Ena				X	
RTU-C2 Rms 110F/110H/112 (114)					
RTU~C2 SAF A	X				
RTU~C2 SAT	X				
RTU~C2 MAT	X				
RTU~C2 RAT	X				
RTU~C2 RA RH	X				
RTU~C2 RA CO2	X				
RMT~110F	X				
RMT~112	X				
RMT~110H	X				
RTU~C2 MAD		X			
RTU~C2 Duct Smk			X		
RTU~C2 Clogged AF			X		
RTU~C2 SAF Ena				X	
RTU~C2 Clg1 Ena				X	
RTU~C2 Clg2 Ena				X	
RTU~C2 Htg1 Ena				X	
RTU~C2 Htg2 Ena				X	
RTU-C3 Rms 200/224/226/228 -Tech Servs (104)					
RTU~C3 SAF A	X				
RTU~C3 SAT	X				
RTU~C3 MAT	X				
RTU~C3 RAT	X				
RTU~C3 RA RH	X				
RTU~C3 RA CO2	X				

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RMT~226	X				
RMT-IT Rm	X				
RMT~224	X				
RTU~C3 MAD		X			
RTU~C3 Duct Smk			X		
RTU~C3 Clogged AF			X		
RTU~C3 SAF Ena				X	
RTU~C3 Clg1 Ena				X	
RTU~C3 Clg2 Ena				X	
RTU~C3 Htg1 Ena				X	
RTU~C3 Htg2 Ena				X	
RTU-C4 Rms 201-205 (112)					
RTU~C4 SAF A	X				
RTU~C4 SAT	X				
RTU~C4 MAT	X				
RTU~C4 RAT	X				
RTU~C4 RA RH	X				
RTU~C4 RA CO2	X				
RMT~205	X				
RMT~203	X				
RTU~C4 MAD		X			
RTU~C4 Duct Smk			X		
RTU~C4 Clogged AF			X		
RTU~C4 SAF Ena				X	
RTU~C4 Clg1 Ena				X	
RTU~C4 Clg2 Ena				X	
RTU~C4 Htg1 Ena				X	
RTU~C4 Htg2 Ena				X	
RTU-C5 Rm 113/115 (102)					
RTU~C5 SAF A	X				
RTU~C5 SAT	X				
RTU~C5 MAT	X				
RTU~C5 RAT	X				
RTU~C5 RA RH	X				
RTU~C5 RA CO2	X				
RMT~113/115	X				
RTU~C5 MAD		X			
RTU~C5 Duct Smk			X		
RTU~C5 Clogged AF			X		
RTU~C5 SAF Ena				X	
RTU~C5 Clg1 Ena				X	
RTU~C5 Clg2 Ena				X	
RTU~C5 Htg1 Ena				X	
RTU~C5 Htg2 Ena				X	
RTU-D1 Rm 201 (Library) (108)					
RTU~D1 SAF A	X				

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RTU~D1 SAT	X				
RTU~D1 MAT	X				
RTU~D1 RAT	X				
RTU~D1 RA RH	X				
RTU~D1 RA CO2	X				
OSAT	X				
OSA RH	X				
OSA CO2	X				
RMT~201	X				
RTU~D1 MAD		X			
RTU~D1 Duct Smk			X		
RTU~D1 Clogged AF			X		
RTU~D1 SAF Ena				X	
RTU~D1 Clg1 Ena				X	
RTU~D1 Clg2 Ena				X	
RTU~D1 Htg1 Ena				X	
RTU~D1 Htg2 Ena				X	
RTU-D2 Rms 107/111/109 (117)					
RTU~D2 SAF A	X				
RTU~D2 SAT	X				
RTU~D2 MAT	X				
RTU~D2 RAT	X				
RTU~D2 RA RH	X				
RTU~D2 RA CO2	X				
RMT~109	X				
RMT~111	X				
RMT~107	X				
RTU~D2 MAD		X			
RTU~D2 Duct Smk			X		
RTU~D2 Clogged AF			X		
RTU~D2 SAF Ena				X	
RTU~D2 Clg1 Ena				X	
RTU~D2 Clg2 Ena				X	
RTU~D2 Htg1 Ena				X	
RTU~D2 Htg2 Ena				X	
Boiler Control (200)					
HWS	X				
HWR	X				
OAT	X				
HWP1_PROOF			X		
HWP2_PROOF			X		
BURNER FLAME FAILURE			X		
BOILER LWC ALARM			X		
Gen Status			X		
FIRE ALARM INPUT			X		
BURNER				X	

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HWP1				X	
HWP2				X	
Outdoor Lights				X	
ENVIRONMENTAL ALARM				X	
Boiler CO			X		
HVAC1 Contoller (300)					
HVAC1 SF VFD Load	X				
HVAC1 RF VFD Load	X				
HVAC1 SA DSP	X				
HVAC1 Bldg Press	X				
HVAC1 RA CO2	X				
HVAC1 RA RH%	X				
HVAC1 RAT	X				
HVAC1 MAT	X				
HVAC1 SAT	X				
OAT	X				
OA RH%	X				
HVAC2 Clg Coil DAT	X				
HVAC1 Clg Coil DAT	X				
HVAC1 SF VFD Spd		X			
HVAC1 RF VFD Spd		X			
HVAC1 MAD (%OA Open)		X			
HVAC1 Gas Heat Dmd Sig		X			
HVAC1 SF VFD Fault			X		
HVAC1 RF VFD Fault			X		
HVAC2 Supply Duct Smk Det			X		
HVAC1 Dirty Filter Alarm			X		
HVAC1 Supply Duct Smk Det			X		
HVAC1 Supply Static Hi Limit			X		
HVAC1 SF VFD Ena				X	
HVAC1 RF VFD Ena				X	
EF2 Ena				X	
HVAC1 Htg Ena				X	
HVAC1 Clg Stg 1				X	
HVAC1 Clg Stg 2				X	
HVAC1 Clg Stg 3				X	
HVAC1 Clg Stg 4				X	
HVAC1 Smk Dmp 1				X	
HVAC1 Smk Dmp 2				X	
HVAC2 Controller (400)					
HVAC2 SF VFD Load	X				
HVAC2 RF VFD Load	X				
HVAC2 SA DSP	X				
HVAC2 Bldg Press	X				
HVAC2 RA CO2	X				
HVAC2 RA RH%	X				
HVAC2 RAT	X				

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HVAC2 MAT	X				
HVAC2 SAT	X				
Light Sensor	X				
HVAC2 SF VFD Spd		X			
HVAC2 RF VFD Spd		X			
HVAC2 MAD (%OA Open)		X			
HVAC2 Gas Heat Sig		X			
HVAC2 SF VFD Fault			X		
HVAC2 RF VFD Fault			X		
EF4 Status			X		
HVAC2 Dirty Filter Alarm			X		
HVAC2 SA DSP Hi Limit			X		
HVAC2 SF VFD Ena				X	
HVAC2 RF VFD Ena				X	
C201A MOD				X	
HVAC2 Htg Ena				X	
HVAC2 Clg Stg 1				X	
HVAC2 Clg Stg 2				X	
HVAC2 Clg Stg 3				X	
HVAC2 Clg Stg 4				X	
EF1 Ena				X	
VAV-1 RM138 (301)					
DischargeAirTemp_AI1	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-2 RM136 (302)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-3 RM132 (303)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
VAV-4 RM134 (304)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				

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SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Duct Reheat Coil		X			
Baseboard Heat				X	
VAV-5 RM130 (305)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-6 RM124 (406)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
VAV-7 Bookstore (407)				X	
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-8 Corridor (308)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
VAV-9 Corridor (409)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
VAV-10 RM133 (310)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				

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VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-11 RM131 (311)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-12 RM129 (312)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-13 Rm121 (413)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-14 Rm119L (414)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-15 Rm119R (415)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-16 RM242 (316)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				

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SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-17 RM240 (317)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-18 RM238 (318)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-19 RM236 (319)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-20 Conference Room 232 (420)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-21 RM234 (421)					
DischargeAirTemp_AI1	X			X	
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
VAV-22 RM201G/F (422)					
DischargeAirTemp_AI1	X				

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Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
VAV-23 RM201E/C (423)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-24 RM202/201D (424)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-25 Corridor (325)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
VAV-26 Corridor (426)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Duct Reheat Coil		X			
VAV-27 RM249 (327)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Duct Reheat Coil		X			
Baseboard Heat				X	
VAV-28 RM247R (328)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				

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VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Duct Reheat Coil		X			
Baseboard Heat				X	
VAV-29 RM247L (329)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Duct Reheat Coil		X			
Baseboard Heat				X	
VAV-30 RM241B (330)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-31 RM241 (431)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-32 RM239 (432)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
VAV-33 RM239A (433)					
DischargeAirTemp_AI1	X				
Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
VAV-34 RM247A (334)					
DischargeAirTemp_AI1	X				

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Damper1Feedback_AI5	X				
VAVAirflow_AI6	X				
SpaceTemp_AI1001	X				
VAV Actuator (on-board)					
Reheat Coil		X			
Baseboard				X	
Alternate No.1 - Additional Control Points:					
Stair North CUH-2 SpaceTemp	X				
Stair North CUH-2 Control Valve				X	
Stair Clock Tower, CUH-4 SpaceTemp	X				
Stair Clock Tower, CUH-4 Control Valve				X	
Rm 115 Kitchen Hood Panel A110A Alarm			X		
Rm 115 Kitchen Hood Panel A110B Alarm			X		
Rm 118 SpaceTemp	X				
Rm 118 Gas Unit Heater On/Off				X	
Rm 118B SpaceTemp	X				
Rm 118B Gas Unit Heater On/Off				X	
Rm 118B DHW Electric Heat Tracing On/Off				X	
Rm 118B Gas Water Heater Alarm			X		
Rm 126 SpaceTemp (Data Closet)	X				Monitoring only
Rm 127/121A SpaceTemp	X				
Rm 127/121A Baseboard				X	
Rm 201C SpaceTemp	X				
Rm 201C Baseboard				X	
Rm 201J SpaceTemp (Data Closet)	X				Monitoring only
Rm 241A SpaceTemp	X				
Rm 241A Baseboard				X	
Rm 245 SpaceTemp	X				
Rm 245 Baseboard				X	

END OF SECTION

SECTION 23 21 13 - HYDRONIC PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Heating water piping.
- B. Related Sections:
 - 1. Section 23 07 00 - HVAC Insulation: Product requirements for Piping Insulation for placement by this section.

1.2 REFERENCES

- A. American Society of Mechanical Engineers:
 - 1. ASME B16.3 - Malleable Iron Threaded Fittings.
 - 2. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
 - 3. ASME B31.9 - Building Services Piping.
- B. ASTM International:
 - 1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 2. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service.
 - 3. ASTM B88 - Standard Specification for Seamless Copper Water Tube.

1.3 SUBMITTALS

- A. Not required.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit instructions for installation and changing components, spare parts lists, exploded assembly views.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ASME B31.9 code for installation of piping systems and ASME Section IX for welding materials and procedures.

1.6 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 HEATING WATER PIPING, ABOVE GROUND

- A. Steel Pipe: ASTM A53/A53M, Schedule 40, black.
 - 1. Fittings: ASME B16.3, malleable iron or ASTM A234/A234M, forged steel welding type.
 - 2. Joints: Threaded for pipe 2 inch and smaller
- B. Copper Tubing: ASTM B88, Type L drawn.

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1. Fittings: ASME B16.18, cast brass, ASME B16.22, solder wrought copper, or Propress mechanical joint fittings
2. Joints: Solder, lead free, ASTM B32, 95-5 tin-antimony, or tin and silver, with melting range 430 to 535 degrees F or Propress mechanical joint fitting.

PART 3 EXECUTION

3.1 PREPARATION

- A. Ream pipe and tube ends. Remove burrs.
- B. Remove scale and dirt on inside and outside before assembly.
- C. After completion, fill, clean, and treat systems.

3.2 INSTALLATION - ABOVE GROUND PIPING SYSTEMS

- A. Install heating water piping in accordance with ASME B31.9.

3.3 FIELD QUALITY CONTROL

- A. Test heating water piping system in accordance with ASME B31.9.

END OF SECTION