



HARRIMAN

York School Department
Mechanical Upgrades
York, Maine

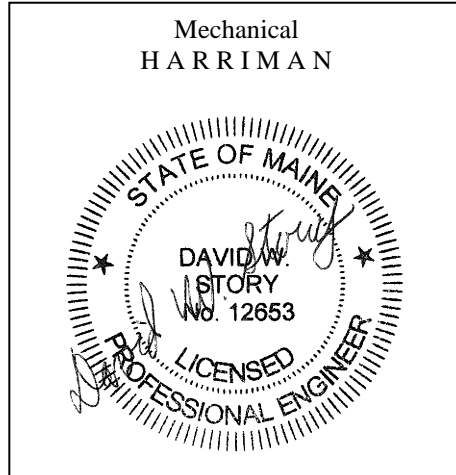
Project No. 21295

May 19, 2022

Construction Documents

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PROFESSIONAL SEAL PAGE



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YORK SCHOOL DEPARTMENT
MECHANICAL UPGRADES
YORK, MAINE

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SECTION 1-A
INSTRUCTIONS TO BIDDERS
(PUBLIC SCHOOL PROJECT)

1. At the time of the opening of proposals, each bidder will be presumed to have inspected the site and to have read and be thoroughly familiar with the plans and contract documents, including all addenda. The failure or omission of any bidder to receive or examine any form, instrument, or document shall in no way relieve any bidder from any obligation in respect to his proposal. The Owner reserves the right to accept or reject any or all proposals as may best serve the interest of the Owner.

2. (a) General Contractors shall use the proposal form for General Contractor included in the specification. One (1) copy shall be filled out and signed and sent to the Owner in a sealed envelope to arrive on or before the time specified in the "Notice to Building Contractors" Section 2-A.

(b) Telegraphic proposal from the General Contractors will not be considered, but modifications by telegram of proposals already submitted will be considered, if received prior to the hour set for receipt of proposals. If the telegram discloses the amount of the proposal submitted, the proposal will be declared invalid.

3. Subject to the Owner's right, reserved herein, to accept or reject any or all proposals, the General Contractor will be selected on the basis of the sum of the lowest acceptable proposal plus such of the alternates as the Owner desires to use.

4. The Owner is exempt from the payment of Federal Excise Tax on articles not for resale and the Federal Transportation Tax on all shipments. The Contractor shall quote less these taxes.

5. Maine State Sales and Use Tax should not be included in your quotation as the Owner is exempt from the payment of such taxes. All Contractors and Sub-Contractors should refer to State of Maine, Bureau of Taxation "Sales and Use Tax Division" for latest bulletin covering Sales and Use Tax Regulations.

6. No proposal may be withdrawn during a period of thirty (30) calendar days immediately following the opening of the General contract proposals.

7. No contract may be assigned, sublet or transferred without the written consent of the Owner.

8. (a) All foreign corporations intending to do business in the State of Maine must comply with the provisions of Title 13-A M.R.S.A., Chapter 12. Any foreign corporation receiving notice of award of contract shall contact the Secretary of State for the purpose of complying with this statute.

(a) All individuals not residents of the State of Maine are subject to the provisions of Title 14, M.R.S.A., Section 704-A.

(b) It may be necessary for the General Contractor to submit to the Owner documentary evidence that the provisions have been complied with.

9. The selected General Contractor will be required to furnish a 100% performance bond and a 100% payment bond to cover the execution of his contract in conformity with the form of bonds shown in sections 2-C2 and 2-C3.

10. General Contractors may be required to furnish a statement of their business experience, record of accomplishments, and financial responsibility at the discretion of the Owner.

11. (a) The date of completion is stated in the proposal form section 2-B-1 and in the contract form section 2-E. If the Contractor finds it impossible to complete the work on or before the said date of completion, he may make a written request to the Owner for an extension of time setting forth therein the reasons for the request. If the Owner finds that the work was delayed because of conditions beyond the control and without the fault of the Contractor he may extend the date of completion in such amount as, in his judgment, the conditions warrant. The said new date of completion shall then be in full force and affect the same as though it were the original date of completion.

(b) Time is an essential element of the contract and it is important that the work be pressed vigorously to completion. The cost to the Owner of administration of the Contract, inspection and supervision will be increased as the time occupied in the work is lengthened.

12. (a) The proposal shall be based on the materials, methods, equipment and products as specified.

(b) Any materials, methods, equipment and products not herein specified but deemed worthy of consideration by any General Contractor or Sub-Contractor, may be introduced by a separate letter attached to his proposal. He shall state the cost comparison with the specified methods, equipment and products and the reason for the suggested substitution.

(c) It shall be understood by the General Contractor or Sub-Contractor that the attached letter describing the proposed change will not be used in determining the low General or Sub-Contract proposal submitted unless the General or Sub-Contractor shall have submitted their list of proposed changes to the Designer 10 days prior to the date set for the receipt of their respective proposals, the Designer shall have issued an addendum related to the change(s) proposed, and the Contractor shall have received written approval by the Designer.

13. Employment Practices

(a) Listing of job vacancies; [Executive Order No. 5, dated December 6, 1971](#), requires that "the Contractor, or any Sub-Contractor holding a contract directly under the Contractor, shall, to the maximum feasible, list all its suitable employment openings with the Maine Employment Security Commission."

(b) "This provision shall not apply to employment openings which the Contractor proposed to fill from its own organization."

(c) Two copies of a "Quarterly Report of New Hires" shall be prepared by the 7th of January, April, July and October for the calendar quarter to which data pertains and sent to the local office of the Maine Employment Security Commission.

(d) A copy of the reporting form is attached to these Instructions to Bidders. These may be obtained from the nearest [office of M.E.S.C.](#) serving the area.

14. Code of Fair Practices; [Executive Order No. 11, dated July 1, 1972](#), requires that every State contract for public works contain the following provisions: "During the performance of this contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religious creed, sex, national origin, ancestry or age. Such action shall include, but not be limited to the following: employment upgrading, demotions, transfers, recruitment or recruitment advertising; layoffs or terminations; rates of pay or other forms of compensation; and selection of training including apprenticeship.

(b) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor; state that all qualified applicants will receive consideration for employment without regard to race, color, religious creed, sex, national origin, ancestry or age.

(c) The Contractor will send to each labor union or representative of the workers with which he has a collective or bargaining agreement, or other contract or understanding, whereby he is furnished with labor for the performance of his contract, a notice, to be provided by the contracting department or agency, advising the said labor union or workers' representative of the Contractors commitment under this section and shall post copies of the notice in conspicuous places available to employees and to applicants for employment."

(d) The Contractor will cause the foregoing provisions to be inserted in all contracts for any work covered by this agreement so that such provisions will be binding upon each Sub-Contractor.

15. OSHA - Safety Regulations. This project is subject to compliance with all requirements of the Occupational Safety and Health Administration, Volume 36, No. 105 of the Federal Register, U.S. Department of Labor published Saturday, May 29, 1971 as amended.

16. Any proposal that contains an escalation clause will be invalid.

17. Any and all Designer interpretations and/or clarifications of bidding documents must be in the form of written addenda issued from the Designer office to all bidders who are on record at the Designer office not later than 72 hours prior to scheduled receipt of bids. (No verbal interpretations and/or clarifications shall be allowed as a substitute for written addenda.)

18. Questions by the bidder concerning alternate work descriptions/content/completeness and bidding process must be clarified with the Designer to assure the proper bidding and execution of

all work intended under the alternate. This clarification must be in the form of a written addendum as described in item 19 above.

19. Preparation of General Contract Bid Proposal.

- (a) General contract bidders are responsible for the completeness of their bid proposal on form issued with bidding document.
- (b) Proposal must show cost of work specified including work specified; in any and all legally issued addenda.
- (c) Any General contract proposal which fails to include the cost of work specified in an alternate may be declared informal if the Owner elects to include said alternate in the General contract.
- (d) Proposal is to acknowledge all addenda that may have been legally issued. (Failure to acknowledge may be cause to have bid declared informal.)
- (e) Indicate time for completion of the work, if required.
- (f) Include corporate/partnership information as required.
- (g) Proposal must be signed in ink.
- (h) Proposal must be accompanied by required certified or cashier's check or a duly signed and executed bid bond.

SECTION 2-A

NOTICE TO BUILDING CONTRACTORS
(PUBLIC SCHOOL PROJECTS)

Sealed proposals in envelopes plainly marked, Proposal For:

York School Department Mechanical Upgrades

Brief Job Description: The work consists of York Middle School and York High School mechanical upgrades.

Addressed to: Mr. Chris Rynne
York School Department
469 US Route 1
York, ME 03909

Email: crynne@yorkschoools.org

Phone: (207) 363-3403 x10033

Proposals will be opened and read aloud at 3:00 pm on June 21, 2022, at the office of the Superintendent of Schools. Bids received after 3:00 pm will not be considered and will be returned unopened.

A mandatory pre-bid conference for General Contractors, to review project scope and bid requirements, will be held inside the main entrance of York Middle School on Friday, June 3, 2022 at 4:00 p.m. Attendance is required by General Contractors to bid the project.

General contract proposals must be accompanied by a certified or cashier's check for 5% of the proposal or a satisfactory bid bond (2-C1) in a similar amount. The owner reserves the right to waive all formalities, and reject any and all proposals or to accept any proposal. Proposals shall be submitted upon the form provided by the architect.

The selected general contractor will be required to furnish a 100% contract performance bond and a 100% contract payment bond to cover the execution of the work which shall be in conformity with the form of bonds contained in section 2-C of the specifications and for the contract amount.

General Contractors and Subcontractors can download Bid Documents from the BGS site at <https://www.maine.gov/dafs/brem/business-opportunities>.

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SECTION 2-B1

PROPOSAL FORM FOR GENERAL CONTRACTORS
(PUBLIC SCHOOL PROJECTS)

BIDDER: _____

TO: Mr. Chris Rynne
York School Department
469 US Route 1
York, ME 03909

A. Having carefully examined the form of contract, general conditions, special provisions and plans and specifications dated May 19, 2022, Prepared by: Harriman, Architects + Engineers for the York School Department ADA Upgrades, as well as the premises and conditions affecting the work, we the undersigned propose to furnish all labor, equipment, and materials necessary for and reasonably incidental to the construction and completion of this proposal for the amount of:

\$ _____

Allowances: The above amount includes the quantity and cash allowances contained in the bid documents.

C. This proposal includes the following addenda to the drawings and specifications:

Addendum No. _____, Dated _____

Addendum No. _____, Dated _____

E. The undersigned agrees, if this proposal is accepted, to sign a contract and deliver it, along with the bonds and affidavits of all insurance specified within twelve (12) calendar days after the date of notification of such acceptance, except if the 12th day falls on a holiday, a Saturday or Sunday, then the conditions will be fulfilled if the required documents are received before 12 o'clock noon on the day following the holiday, or the Monday following the Saturday or Sunday, and as a guarantee thereof, herewith submits a certified or cashier's check or bid bond as required.

F. The undersigned agrees, if awarded the contract, to substantially complete the work on August 26, 2022 in accordance with Section 011000.

G. This proposal includes the cost of a 100% performance bond and a 100% payment bond.

Signed _____

By _____

Address _____

NOTE: If bidder is a corporation, write State of incorporation, and if a partnership, give full names of all partners.

Contractor Bid Form

Bid Proposal Schedule of Values

Div.	Description of Work	Cost
1	General Requirements	\$
2	Existing Conditions	\$
3	Concrete	\$
4	Masonry	\$
5	Steel	\$
6	Carpentry	\$
7	Thermal and Moisture Protection	\$
8	Openings	\$
9	Finishes	\$
10	Specialties	\$
11	Equipment	\$
12	Furnishings	\$
13	Special Construction	\$
14	Conveying Equipment	\$
21	Fire Suppression	\$
22	Plumbing	\$
23	HVAC	\$
26	Electrical	\$
27	Communications	\$
28	Electronic Safety and Security	\$
31	Earthwork	\$
32	Exterior Improvements	\$
33	Utilities	\$

Subtotal: \$

Mark-Ups

General Conditions	
Bonds and Insurances	

Subtotal: \$

BASE BID SUBMISSION TOTAL: \$

Best Value Completion Date:

A. Contractors Proposed Substantial Completion: _____ (\$ _____)

Date

Deduct

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SECTION 2-C1
SHORT FORM
FORM OF GENERAL CONTRACT BID BOND
(Public School Projects)

KNOW ALL MEN BY THESE PRESENTS, THAT WE, THE UNDERSIGNED

(1) _____,

(2) _____

OF _____ AND STATE OF _____

AS PRINCIPAL AND (3) _____

AS SURETY, ARE HEREBY HELD AND FIRMLY BOUND UNTO (4) _____

_____ IN THE PENAL SUM OF _____

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 (5) _____ DAY OF _____ 20____.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT WHEREAS THE PRINCIPAL HAS SUBMITTED TO (6) OWNER _____

A CERTAIN PROPOSAL, ATTACHED HERETO AND HEREBY MADE A PART HEREOF, TO ENTER INTO A CONTRACT IN WRITING, FOR THE CONSTRUCTION OF (7) _____

NOW THEREFORE:

(A) IF SAID PROPOSAL SHALL BE REJECTED, OR, IN THE ALTERNATE,

(B) IF SAID PROPOSAL 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 PROPOSAL) AND SHALL FURNISH A BOND FOR HIS 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 PROPOSAL, 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 BOND SHALL BE IN NO WAY IMPAIRED OR AFFECTED BY ANY EXTENSION OF TIME WITHIN WHICH THE PRINCIPAL MAY ACCEPT SUCH PROPOSAL: AND SAID SURETY DOES HEREBY WAIVE NOTICE OF ANY SUCH EXTENSION.

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 OFFICES, THE DAY AND YEAR FIRST SET ABOVE.

SIGNED AND SEALED THIS (5) _____ DAY OF _____ 20__.

WITNESS: _____ CONTRACTOR: _____

_____ By _____ (L.S.)

_____ By _____ (L.S.)

_____ By _____ (L.S.)

WITNESS: _____ SURETY: _____

_____ By _____ (L.S.)

_____ By _____ (L.S.)

APPROVED AS TO FORM _____, 20_____.

BY _____

(Owner's Attorney)

Legend

- (1) Correct name of contractor.
- (2) A corporation, a partnership, or an individual, as the case may be.
- (3) Correct name of surety.
- (4) Treasurer of the municipality or school administrative district, as the case may be.
- (5) Same date as that of proposal.
- (6) Owner shall be the municipality or school administrative district, as the case may be.
- (7) Name of project as designated in the contract documents.

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

SECTION 2-C2

LONG FORM
FORM OF GENERAL CONTRACT PERFORMANCE BOND
(Public School Projects)

KNOW ALL MEN BY THESE PRESENTS THAT (1) _____

_____ (2) _____

OF _____ AND STATE OF _____

AS PRINCIPAL, AND (3) _____

A CORPORATION DULY ORGANIZED UNDER THE LAWS OF THE STATE OF _____

AND HAVING A USUAL PLACE OF BUSINESS IN _____ AS

SURETY, ARE HELD AND FIRMLY BOUND UNTO THE (4) _____

AS OBLIGEE, IN THE PENAL SUM OF _____ DOLLARS

(\$ _____), TO BE PAID SAID _____

OR HIS SUCCESSORS IN OFFICE, FOR WHICH PAYMENT WELL AND TRULY TO BE MADE,

PRINCIPAL AND SURETY BIND THEMSELVES, THEIR HEIRS, EXECUTORS AND

ADMINISTRATORS, SUCCESSORS AND ASSIGNS, JOINTLY AND SEVERALLY BY THESE

PRESENTS.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT IF THE PRINCIPAL SHALL
PROMPTLY AND FAITHFULLY PERFORM THE CONTRACT ENTERED INTO ON THE

(5) _____ DAY OF _____ A.D. 20____ FOR THE

CONSTRUCTION OF (6) _____

THEN THIS OBLIGATION SHALL BE NULL AND VOID: OTHERWISE IT SHALL REMAIN IN
FULL FORCE AND EFFECT.

THE SURETY HEREBY WAIVES NOTICE OF ANY ALTERATION OR EXTENSION OF
TIME MADE BY THE (7) OWNER.

SIGNED AND SEALED THIS (5) _____ DAY OF _____ 20____

WITNESSES: _____ CONTRACTOR _____

_____ By _____ (L.S.)

_____ By _____ (L.S.)

_____ By _____ (L.S.)

WITNESSES: _____ SURETY: _____

By _____ (L.S.)

By _____ (L.S.)

APPROVED AS TO FORM _____, 20____.

BY _____
(Owner's Attorney)

Legend

- (1) Correct name of contractor.
- (2) A corporation, a partnership, or an individual, as the case may be.
- (3) Correct name of surety.
- (4) Treasurer of the State of Maine.
- (5) Same date as that of contract.
- (6) Name of project as designated in contract documents.
- (7) Owner shall be the State of Maine.

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

SECTION 2-C3

SHORT FORM
FORM OF GENERAL CONTRACT PAYMENT BOND
(Public School Projects)

KNOW ALL MEN BY THESE PRESENTS THAT (1) _____
 _____ (2) _____
 OF _____ AND STATE OF _____
 AS PRINCIPAL AND (3) _____
 A CORPORATION DULY ORGANIZED UNDER THE LAWS OF THE STATE OF _____
 AND HAVING A USUAL PLACE OF BUSINESS IN _____ AS SURETY ARE HELD AND
 FIRMLY BOUND UNTO THE (4) _____ IN THE SUM OF
 _____ DOLLARS, (\$ _____) FOR THE USE
 AND BENEFITS OF CLAIMANTS* AS HEREIN BELOW DEFINED, THE PAYMENT WHEREOF
 PRINCIPAL AND SURETY BIND THEMSELVES, THEIR HEIRS, EXECUTORS AN ADMINISTRATORS,
 SUCCESSORS AND ASSIGNS, JOINTLY AND SEVERALLY BY THESE PRESENTS. THE CONDITION OF
 THIS OBLIGATION IS SUCH THAT IF THE PRINCIPAL SHALL PROMPTLY SATISFY ALL CLAIMS AND
 DEMANDS INCURRED FOR ALL LABOR AND MATERIAL, USED OR REQUIRED BY HIM IN
 CONNECTION WITH THE WORK CONTEMPLATED IN THE CONTRACT ENTERED INTO ON THE
 (5) _____ DAY OF _____ A.D. 20___ FOR THE CONSTRUCTION OF
 (6) _____, AND SHALL FULLY
 REIMBURSE THE OBLIGEE FOR ALL OUTLAY AND EXPENSE WHICH SAID OBLIGEE MAY INCUR IN
 MAKING GOOD ANY DEFAULT OF SAID PRINCIPAL, THEN THIS OBLIGATION BE NULL AND VOID:
 OTHERWISE, IT SHALL REMAIN IN FULL FORCE AND EFFECT.

* A claimant is defined as one having a direct contract with the principal or with a subcontractor of the principal for labor, material, or both, used or reasonably required for use in the performance of the contract.

SIGNED AND SEALED THIS (5) _____ DAY OF _____ 20 _____

WITNESSES: _____ CONTRACTOR: _____

_____ BY _____ (L.S.)

_____ BY _____ (L.S.)

_____ BY _____ (L.S.)

WITNESSES: _____ SURETY _____ (L.S.)

_____ BY _____ (L.S.)

_____ BY _____ (L.S.)

APPROVED AS TO FORM _____, 20 _____.

BY _____
(Owner's Attorney)

Legend

- (1) Correct name of contractor.
- (2) A corporation, a partnership, or an individual, as the case may be.
- (3) Correct name of surety.
- (4) Treasurer of the municipality or school administrative district, as the case may be.
- (5) Same date as that of contract.
- (6) Name of project as designated in the contract documents.

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

SECTION 2-E

STATE OF MAINE
CONSTRUCTION CONTRACT
(Public School Project)

THIS AGREEMENT made the date of month in the year 2022 by and between the York School Department hereinafter called the *Owner*, and Contractor company name hereinafter called the *Contractor*.

WITNESSETH, That the *Owner* and the *Contractor* for the consideration hereinafter named agree as follows:

ARTICLE 1 SCOPE OF WORK

§ 1.1 The *Contractor* shall furnish all of the materials and perform all the work described in the specifications and shown on the drawings for the project entitled: York School Department Mechanical Upgrades.

§ 1.2 The specifications and the drawings have been prepared by Harriman, acting as Designer and named in the documents as the Architect or Engineer. This firm has responsibilities for defining the scope of work governed by their agreement with the *Owner*, the specifications and the drawings, and the General Conditions and Special Provisions of the contract.

ARTICLE 2 COMPLETION DATE

§ 2.1 The work to be performed under this contract shall be completed on or before August 26, 2022. For each calendar day the project remains uncompleted \$750.00 shall be charged as liquidated damages.

ARTICLE 3 CONTRACT SUM

§ 3.1 The *Owner* shall pay the *Contractor* for the performance of the contract, subject to additions and deductions provided by approved Change Orders in current funds as follows: amount in words dollars and 00cents, \$0.00

ARTICLE 4 CONTRACT BONDS

§ 4.1 Contract bonds are not required if the contract amount is less than \$100,000 unless bonds are specifically mandated by the contract documents.

§ 4.2 On this project, the *Contractor shall* furnish the *Owner* the appropriate contract bonds in the amount of 100% of the contract amount.

ARTICLE 5 PROGRESS PAYMENTS

§ 5.1 The *Owner* shall make payments on account of the contract as provided therein as follows: Each month 95% of the value, based on contract prices of labor and materials incorporated in the work and of materials suitably stored at the site thereof up to the first day of that month, as certified by the Architect or Engineer.

§ 5.2 The *Owner* may cause the *Contractor* to be paid such portion of the amount retained hereunder as he deems advisable.

ARTICLE 6 FINAL PAYMENT

§ 6.1 Final payment shall be due 60 days after completion and acceptance of the work, provided the *Contractor* has submitted evidence satisfactory to the *Owner* that all payrolls, material bills and other indebtedness connected with the work has been paid.

ARTICLE 7 CONTRACT DOCUMENTS

§ 7.1 The General Conditions of the contract, Special Provisions, the written specifications and the drawings, and any Addenda, together with this agreement, form the contract; they are as fully a part of the contract as if hereto attached or herein repeated.

§ 7.2 Specifications: *date of issuance*

§ 7.3 Drawings: *each sheet number and title*

§ 7.4 Addenda: *each addenda number and date, or "none"*

ARTICLE 8 OTHER PROVISIONS

§ 8.1 None

The *Owner* and the *Contractor* hereby agree to the full performance of the covenants herein.

IN WITNESS WHEREOF the parties hereby execute this agreement the day and year first above written.

OWNER

CONTRACTOR

(Signature) (Date)

(Signature) (Date)

(Printed name and title)

(Printed name and title)

York School Department

(Contractor company name)

(School Administrative Unit name)

(Contractor company name)

SECTION 3-A

STATE OF MAINE

STANDARD GENERAL CONDITIONS
AND
CONTRACT WORK

For

PUBLIC SCHOOL PROJECTS

Public School Projects
Sec. 3-A

October 17, 1988

Rev. 12/21/92; 4/20/99, 11/08/01

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Public School Projects
Sec. 3-A

ARTICLE 1. DEFINITIONS

Whenever the following terms are used in these specifications or the contract, the intent and meaning shall be interpreted as follows:

Designer: The project Architect and/or Engineer whose name appears on the plans and/or specifications for the project, acting directly or through an authorized representative.

Bid Security: The security designated in the proposal, furnished by bidders as a guaranty of good faith to enter into a contract with the state, should a contract be awarded to that bidder.

Bidder: Any individual, partnership, or corporation submitting a proposal for the performance of the work described under the terms of the contract, acting directly or through a duly authorized representative.

Bureau: The Bureau of General Services.

Calendar Days: Consecutive days, as occurring on a calendar, taking into account the day of the week, month, year, and any religious, national or local holidays.

Change Order: A written agreement between the Owner and the Contractor, operating as a supplement to the contract, covering correction of: omissions, errors, and discrepancies between the plans and the proposal or estimates; or any alterations in the plans; or additional requirements; work, materials, and incidentals required to complete the construction of the project in an acceptable manner, and setting forth the basis of compensation for that supplemental work, if any. Before any change order modifies or becomes a part of the work, it must be duly signed by the Contractor, and the Owner, and approved by the Bureau of General Services and the Designer.

Clerk of the Works: The authorized representative of the Designer.

Contract: A written agreement between the Owner and the successful bidder, by which the Contractor is bound to perform the work specified, in accordance with plans, specifications, general conditions, and special provisions, that are a part of the contract documents, together with all supplemental agreements by which the Owner is bound to compensate the Contractor at mutually established and accepted rates or prices.

Contract Bond: The approved forms of security furnished by the Contractor and his surety, or sureties, 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.

Contract Documents: The contract documents consist of the contract, general conditions, special provisions, the plans and specifications including all addenda, change orders, and all other modifications thereof, that were incorporated in the documents

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subsequent to their execution.

Contractor: The individual, partnership, or corporation 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.

Director of the Bureau of General Services: The State Director of the Bureau of General Services or his/her duly authorized representative.

Final Completion: The stage of the Work when the Work has been fully completed in accordance with the terms and conditions of the Contract Documents.

Owner: School Administrative Unit, acting through its duly authorized representative.

Owner's Representative:

Plans: All official drawings or reproductions of drawings pertaining to the work provided for in the contract and such working plans as may be furnished or approved by the Owner or Designer from time to time.

Project: The entire improvement proposed by the Owner to be constructed in part or in whole pursuant to these specifications and contract documents. Where the word "Job" appears it shall mean the project.

Proposal or Bid: The written offer of the bidder, on a form prescribed to perform the work specified.

Provide: The word "provide" shall mean, "furnish and install," including connections to services if required, unless specified otherwise.

Sub-Contractor: The individual, the firm or corporation undertaking the execution of any part of the work under the terms of the contract by virtue of a written agreement between itself and the Contractor.

Substantial Completion: The stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. Minor corrections and repairs that can be performed while the Owner has occupied the building and without undue annoyance to personnel will be acceptable under the definition of Substantial Completion. It shall also include major final cleaning required under the Contract, removal of all surplus equipment and material not required for completion of remaining work, and the placement of remaining materials and equipment in convenient locations as approved by the Owner.

Superintendent: The representative of the Contractor, authorized by the Contractor to receive and fulfill instructions from the Designer.

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Supplemental Agreement: A supplemental agreement is any agreement entered into between the Contractor and the Owner with the approval of the Bureau and the Designer subsequent to the execution of the contract.

Surety: The individual, partnership, or corporation who is bound jointly and severally with the Contractor and sub-Contractor to insure his faithful performance of the contract and for his payment of the bills for labor, materials and equipment by the Contractor and Sub-Contractors.

Work: See Project.

ARTICLE 2. INTENT, CORRELATION AND EXECUTION OF DOCUMENTS

The intent of the Contract Documents is to prescribe a complete work or improvement. The Plans, including all revisions, General Conditions for Contract Work, Special Provisions, Instructions to Bidders, Proposal, Contract, Contract Bonds, and all other sections of the specifications, including all addenda, all dated and on file in the Bureau of General Services, prior to the time set for receiving proposals as prepared by the Designer, shall each become a part of the Contract Documents, and all proposals must be based on a full compliance therewith. Any Supplemental Agreements entered into subsequent to the Contract will become a part of said Contract.

The contract documents are complementary, and what is called for by any one shall be as binding as if called for by all. The intention of the documents is that, unless otherwise specified, the Contractor shall furnish all labor, materials, equipment, items, articles, tools, transportation, insurance, services, necessary supplies, operations or methods and incidentals that may be reasonably required to construct and complete the project, facility or improvement in a manner necessary for the proper execution of the work. Any deviations from the plans which may be required by the exigencies of the construction, or because of error, will in all cases, be determined by the Designer, and authorized in writing subject to approval by the Owner and Bureau of General Services. Materials or work described in words, which so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standards. Since the plans and specifications cover the dimensions and features of the work and do not set forth the analysis of the design, it is the duty of the Contractor fulfilling them to ascertain the true intent in any case where it is doubtful.

Work not covered under any heading, section, branch, class or trade of the specifications, shall not be supplied unless it is shown on the drawings or is reasonably inferable there from as being necessary to produce the intended results.

The Contractor shall take no advantage of any apparent error or omission in the plans and specifications, and the Designer shall be permitted to make such corrections and interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications. Where errors or omissions appear in the contract documents, the Contractor shall promptly notify the Designer in writing of such errors or omissions. Inconsistencies in the contract documents are to be reported before proposals are received, whenever found.

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Should the Drawings or the Specifications disagree in themselves or with each other, the Contractor shall provide the better quality or greater quantity of work and/or materials unless otherwise directed by written addendum to the Contract Documents.

The Contractor shall, upon his acceptance of a contract and before commencing work, contact the Designer and request a preconstruction conference. The purpose of this conference shall be as follows:

1. To introduce the members of the Designer's firm and the representative of the Owner and define their responsibilities in connection with this project.
2. To emphasize any special provisions applicable to the project.
3. To establish the work progress schedule and set up procedures for prompt review of all required shop drawings. If the Contract Sum exceeds \$ 10,000,000, the Contractor shall supply the Owner with the planned Critical Path Method ("CPM") schedule prior to the submission of the first payment requisition. The Contractor shall supply the Owner monthly with CPM "as built" schedule updates. The update shall include the dates of activities' start and completion; percent of work remaining for activities started but not completed; narrative report indicating a listing of monthly progress; any changes to critical path activities from the prior update; sources of delay and potential problems; and work planned for the next month. If any date is more than fifteen (15) days behind, the Contractor must submit a recovery schedule. When a Change Order is proposed, the Contractor must identify all schedule impacts which result from the Change Order.
4. To provide the Contractor with opportunity to discuss points of doubt and any apparent inconsistencies noted in the plans and specifications before proceeding to purchase material or execute the work.

During the further progress of work, regular meetings will be held at time intervals appropriate in the judgment of the Designer to review the work progress schedule, general project progress and any other questions, which might affect the execution of this contract.

ARTICLE 3: DETAIL DRAWINGS AND INSTRUCTIONS

The Designer shall furnish, with reasonable promptness, additional instructions by means of drawings or otherwise, that are necessary for the proper execution of the work. All such drawings and instruction shall be consistent with the contract documents, shall be true developments thereof, and shall be reasonably inferable there from.

The work shall be executed in conformity therewith and the Contractor shall do no work without proper drawings and instructions except as allowed by Article 13.

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Immediately after being awarded the contract, the Contractor shall prepare an estimated progress schedule and submit same for Designer's approval. It shall indicate the dates for starting and completion of the various stages of construction.

ARTICLE 4: COPIES FURNISHED

Unless otherwise provided in the contract documents the Contractor will be furnished, free of charge, 10 copies of all drawings, and specifications.

ARTICLE 5: SHOP DRAWINGS

The Contractor shall check and verify all field measurements and shall submit with such promptness as to cause no delay in the Contractor's own work or in that of any other Contractor, adequate copies, checked and approved by the Contractors of all shop drawings and schedules required for the work of the various trades. The Designer shall check and approve, with reasonable promptness, such scheduled drawings only for conformance with the design concept of the project and compliance with the information given in the contract documents. The Contractor shall make any corrections required by the Designer, and shall file with the Designer two corrected copies, and shall furnish such other copies as may be needed. The Designer's approval of such drawings or schedules shall not relieve the Contractor from responsibility for deviations from drawings or specifications, unless the Contractors have, in writing, called the Designer's attention to such deviations at the time of submission and secured the Designer's written approval; nor shall it relieve the Contractors from responsibility for errors in shop drawings or schedules.

ARTICLE 6: DRAWINGS AND SPECIFICATIONS

The Contractor shall keep, in good order, one copy of all drawings and specifications on the work, which will be made available to the Designer and to his representative.

ARTICLE 7: OWNERSHIP OF DRAWINGS

All drawings, specifications and copies thereof furnished by the Designer are the property of the Designer. They are not to be used on other work without written permission from the Designer, and, with the exception of the signed contract set, are to be returned to the Designer upon request, or at the completion of the work.

ARTICLE 8: SAMPLES

The Contractor shall furnish for review, with reasonable promptness, all samples as directed by the Designer. The Designer shall check and review such samples, with reasonable promptness, only for conformance with the design concept of the project and for compliance with the project and for compliance with the information given in the contract documents. The work shall be in accordance with reviewed samples.

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ARTICLE 9: MATERIALS, APPLIANCE, EMPLOYEES

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation and facilities necessary for the execution and completion of the work.

Whenever an article or material is defined by describing a proprietary product, or by using the name of a manufacturer, the term "Or Approved Equal", if not inserted, shall be implied. The specific article or material mentioned shall be understood to establish minimum standards as to the type, function, standard of design, durability, efficiency and quality desired and shall not be construed to exclude other manufacturers' products of comparable quality, design and efficiency.

Materials and models of items, which the Contractor alleges to be equal to the materials and methods of items named in the specifications, shall be subject to the written approval by the Designer. If the alleged equals are to receive consideration in the bid award, written approval shall be received from the Designer at least ten days prior to the established bid opening dates. The use of alternate items will not be permitted without the approval of the Owner and Designer. All approved substitutions shall be in writing and approved by the Designer. The Contractor shall not be relieved of the responsibility to furnish articles or materials equal in quality, design and efficiency to those specified because of the approval of such alternate items by the Designer. The Designer's approval or rejection of a proposed substitution may be based on any of the previous considerations, and his decision may or may not express reasons for rejection and shall be final. Requests for substitutions shall originate and be submitted by the Contractor, not a Sub-Contractor. The materials or equipment shall be sufficiently described to enable the Designer to easily identify salient features.

Any material or products not specified in the bidding documents but being worthy of consideration may be introduced by the Contractor, or Sub-Contractor. The Contractor's submission shall include a cost comparison with the specified material and the reason for the suggested substitution. The basic proposal shall be as specified.

It shall be understood by the general Contractor or Sub-Contractor that the attached letter describing the proposed changes will not be used in determining the low general Contractor or Sub-Contractor proposal submitted, unless the general Contractor or Sub-Contractor has submitted its list to the Designer 10 days prior to the date set for the receipt of their respective proposals and has received written approval by the Designer five days prior to the opening of the bid.

The Contractor shall guarantee his work against any defects in workmanship and materials for a period of one year from the date of the written acceptance of the project.

Materials and equipment shall be new, free from defects, perfect and complete, unless otherwise stipulated. Materials or equipment specified or shown on the drawings shall be applied or installed according to the directions with the manufacturer, or the recommendations of an association dealing primarily with the material, unless specifically designated otherwise. The scope of the direction furnished shall include the application of

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experienced personnel to each trade involved. In no case shall the installation be below the standard recommended by the manufacturer or association.

The Contractor shall be responsible to the Owner for the suitability of materials and equipment furnished and for full compliance with the specification.

The Contractor shall promptly pay all his employees when their pay is due, shall promptly pay when due all bills for materials, supplies and services going into the work, and all bills for insurance, workmen's compensation coverage, federal and state unemployment compensation, and Social Security charges applicable to said project. Before final settlement is made, the Contractor shall furnish to the Owner affidavits that all said payments have been made.

The Contractor shall at all times enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

ARTICLE 10: ROYALTIES AND PATENTS

The Contractor shall, for all time, secure to the Owner the free and undisputed right to the use of any and all patented articles or methods used in the work and shall defend at his own expense any and all suits for infringement or alleged infringement of such patents, and in the event of adverse award under patent suits, the Contractor shall pay such awards and hold the Owner harmless in connection with any patent suits that may arise as a result of installations made by the Contractor, or to any awards made thereunder.

ARTICLE 11: SURVEYS, PERMITS, LAWS, TAXES AND REGULATIONS

The Owner shall furnish all surveys unless otherwise specified.

Permits and licenses necessary for the prosecution of the work shall be secured and paid for by the Contractor. Easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the drawings and specifications are at variance therewith, the Contractor shall promptly notify the Designer in writing and any necessary changes shall be adjusted as provided in the contract for changes in the work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the Designer, the Contractor shall bear all costs arising there from.

Adherence to the Code of Federal Regulations 29 CFR Part 1926 and 29 CFR Part 1910 as adopted by the State Board of Occupational Safety and Health is required by statute.

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The State is exempt from the payment of Federal Excise Taxes on articles not for resale and for the Federal Transportation Tax on all shipments. All quotes from the Contractor and Sub-Contractors shall be free of these taxes. The State is exempt from the payment of Maine State Sales and Use Taxes. All quotes from the Contractor and Sub-Contractors shall be free of these taxes.

In execution and performance of the Contract, the Contractor and all subcontractors agree to be aware of and to comply with the requirements and regulations of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et. seq.)

ARTICLE 12: LABOR AND WAGES

All Contractors and Sub-Contractors shall conform to the labor laws of the State of Maine, and all other laws, ordinances and legal requirements affecting the Work in Maine.

In the employment of laborers, preference shall first be given to residents of the State of Maine who are qualified to perform the work to which the employment relates, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, who may reside in other states.

ARTICLE 13: CONDITIONS AND CARE OF SITE AND PROTECTION OF THE WORK

The Contractor shall continuously maintain adequate protection of all work from damage and shall protect the property from injury or loss for the duration of this contract, and shall make good any such damage, injury or loss. He shall adequately protect adjacent property as provided by law and the contract documents.

The Contractor shall take all necessary precautions for the safety of employees on the work, and shall comply with all applicable provisions of federal, state and municipal safety laws and building codes, and shall prevent accidents or injury to persons on, about or adjacent to the premises where the work is being performed. The Contractor shall erect and properly maintain all necessary safeguards for the protection of workmen and the public at all times, as required by the condition and progress of the work, and shall post danger signs warning against all hazards created by the construction process, such as (but not limited to) protruding nails, hoists, well holes, elevator hatchways, scaffolding, window openings, stairways and falling materials. The Contractor shall designate a responsible member of his organization on the work, whose duty shall be the prevention of accidents. The Contractor shall report the name and position of any person so designated to the Designer.

The Contractor shall return to conditions existing prior to the start of work on the project, all aspects of the site that have not been altered, removed, or otherwise changed permanently by the work. The Contractor shall protect all existing buildings, structures, or other features from damage by any operation in connection with the project. Utilities encountered shall be protected and maintained in service until removed or abandoned.

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The Contractor shall exercise care in his work around such utilities as may be shown on the plot plan or otherwise found. Such utilities are not to be moved, replaced or abandoned.

The Contractor shall protect existing trees, and other aspects of the site, which will remain a permanent part of the site from damage during grading, excavation, filling, trucking, etc. If necessary, tree trunks shall be boxed, and barricades set up at sufficient distance to prevent damage to major tree branches.

Should the work or material of this or any other Contractor employed by the Owner become damaged when reasonably protected, the same shall be replaced by the Contractor causing the damage at no expense to the Owner.

In an emergency potentially affecting health or life or of serious damage to property or of adjoining property, the Contractor, without special instruction or authorization from the Designer or Owner, is hereby permitted to act on his own discretion, to prevent such threatened loss or injury, and the Contractor shall so act, without appeal, if so authorized or instructed. Any compensation claimed by the Contractor on account of emergency work, shall be determined by agreement.

ARTICLE 14: INSPECTION OF WORK

The Designer and his representatives, the Bureau of General Services representatives and the Owner, shall at all times have access to the work whenever it is in preparation or progress. The Contractor shall provide proper facilities for such access and for inspection.

If the specifications, the Designer's instructions, laws, ordinances or any public authority require any work to be specially tested or approved, the Contractor shall give the Designer timely notice of its readiness for observation by the Designer or inspection by another authority, and if the inspection is by another authority than the Designer, on the date fixed for such inspection, required certificates of inspection shall be secured by the Contractor. Observations by the Designer shall be promptly made, and where practicable, prior to work is covered or buried. If any work which will ultimately be covered, is covered prior to approval or consent of the Designer, it must, if requested by the Designer, be uncovered for examination at the Contractor's expense.

Re-examination of questioned work may be ordered by the Designer, and, if so ordered, the work must be uncovered by the Contractor. If such work were found in accordance with the contract documents, the Owner shall pay the cost of the reexamination and replacement. If such work were found not in accordance with the contract documents, the Contractor shall pay such cost, unless it is found that the defect in the work was caused by a Contractor employed as provided in Article 32, and in that event the Owner shall pay such cost.

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The Bureau of General Services, through its representatives shall make periodic inspections of the work during the course of construction and make recommendations to the Designer, when employed. The Designer shall provide adequate inspection of materials, equipment, methods and changes in plans on all projects under his supervision.

ARTICLE 15: SUPERINTENDENCE: SUPERVISION

The Contractor shall have, during the progress of all work, a competent superintendent and any necessary assistants. The superintendent shall not be changed except with the consent of the Owner unless a superintendent proves to be unsatisfactory to the Contractor and ceases to be in his employ. The superintendent shall represent the Contractor and all directions given to the superintendent in the absence of the Contractor shall be as binding as if given directly to the Contractor. Important directions shall be confirmed in writing to the Contractor. Other directions shall be confirmed on written request in each case. The Designer shall not be responsible for the acts or omissions of the superintendent or his assistants.

The Contractor shall give efficient supervision to the work using his best skill and attention. He shall carefully study and compare all drawings, specifications and other instructions and shall at once report to the Designer any error, inconsistency or omission which he may discover, but he shall not be liable to the Owner for any damage resulting from any errors or deficiencies in the contract documents or other instructions by the Designer.

ARTICLE 16: CHANGES IN THE WORK

The Owner reserves the right to increase or decrease any or all of the items of work indicated in the plans, proposal, and contract, or the elimination of any one or more of such items, without invalidating the contract. As the work progresses, the Owner may make such alterations in the plans, in the character of the work, or in the specified coordination of two or more concurrent contracts, as may be considered necessary or desirable in order to complete the construction. Such changes shall in no way invalidate the contract. All such work shall be executed under the conditions of the original contract except that any claim for extension of the time caused thereby shall be adjusted at the time of the ordering of such change.

In giving instructions, the Designer shall have authority to make minor changes in the work, not involving extra cost, and not inconsistent with the purposes of the building or project, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a duly signed change order.

Should the Contractor encounter during the progress of the work, latent conditions at the site materially differing from those shown on the drawings or in the specifications, or unknown conditions of an unusual nature differing materially from those already encountered in such work, the attention of the Designer shall be immediately called for such conditions before they are disturbed. The Designer shall promptly investigate the conditions and if they do so materially differ, the contract shall, with the approval of the Owner and the Bureau be modified by a change order to provide for any increase or decrease in cost resulting from such conditions

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Should such alterations be productive of increased unit cost, or result in decreased unit cost to the Contractor, a fair and equitable sum therefore shall be agreed upon in writing before such work is begun, and shall be added to or deducted from the contract amount, as the case may be, by means of a written change order. The change order shall state the nature of the change, the location, the itemized estimate of unit quantities, the basis for payment, and the reason for the change. Such change order to be on approved forms.

When the change order has been properly signed by all parties and encumbered, it shall become a part of the contract.

The value of any such extra work or change shall be determined in one or more of the following ways:

- A. By estimate and acceptance in a lump sum.
- B. By unit prices named in the contract or subsequently agreed upon.
- C. By cost and percentage or by cost and a fixed fee.

If none of the above methods is agreed upon, the Contractor, provided he receives an order as above, shall proceed with the work.

Under case (C.), he shall keep and present in such form as the Designer may direct, a correct account of the cost, together with vouchers. In any case, the Designer shall certify to the amount, including reasonable allowance for overhead and profit, due to the Contractor. Pending final determination of value, payments on account of changes shall be made on the Designer's certificate.

If the price of a change order cannot be agreed upon, nothing contained herein shall prevent the Designer, with approval from the Owner and BGS, from directing the Contractor to make a change in the work, with the price to be determined on either a cost and percentage basis or under the dispute resolution provision of this contract.

If the price of a change order cannot be agreed upon, an Owner and/or Designer initiated Construction Change Directive can order a change in the work prior to an agreement on the adjusted Contract Sum or Contract Time. The Cost of the work is to be determined by: 1) a cost and percentage basis 2) lump sum 3) unit prices or 4) under the Dispute Resolution provision of this contract.

When the subparagraphs (A) and (C) above are used to determine the value of the work, the allowance for overhead and profit combined, included in the total expense to the Owner, shall be based upon the following schedule:

For the Contractor, for any work performed by his own forces, 20% of the cost; For each Sub-Contractor, for work performed by his own forces, 20% of the cost; For the Contractor, for work performed by his Sub-Contractor, 10% of the amount due the Sub-Contractor.

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Cost shall be limited to the following: Cost of materials, cost of delivery, cost of labor, including Social Security, old age and unemployment insurance (labor cost may include a pro ratio share of foremen's time, only in case an extension of contract time is granted on account of the change); workmen's compensation insurance; rental value of power tools and equipment.

Overhead shall include the following; bond premium, supervision, wages of timekeepers, watchmen and clerks, small tools, incidental, general office expense, and all other expenses not included in "cost".

If the net value of a change results in a credit from the Contractor or Sub- Contractor the credit given shall be the net cost without overhead or profit. The cost as used herein shall include all items of labor, materials and equipment.

ARTICLE 17: CLAIMS FOR EXTRA COST

If the Contractor claims that any instructions by drawings or otherwise involve extra cost under this contract, he shall give the Designer written notice thereof within 10 days after the receipt of such instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property, and the procedure shall then be as provided for in Section 16, "changes in work." No such claim shall be valid unless so made.

ARTICLE 18: DEDUCTIONS FOR UNCORRECTED WORK

If the Designer and Owner deem it inexpedient to correct work injured or done not in accordance with the contract, an equitable deduction from the contract amount shall be made therefore.

ARTICLE 19: DELAYS AND EXTENSION OF TIME

If the Contractor is delayed at any time in the progress of the work by any act or neglect of the Owner or the Designer, or of any employee of either, or by any separate Contractor employed by the Owner, or by changes ordered in the work or by strikes, lockouts, fire, unusual delay in transportation, unavoidable casualties Or by causes beyond the Contractor's control, or by any cause which the Designer shall decide to justify the delay, then the time of completion shall be extended for such reasonable time as the Designer may decide. Inclement weather or other natural causes shall not be reason to allow additional time under this contract.

No such extension shall be made for delay occurring more than seven days before claim therefore is made in writing to the Designer. In case of a continuing cause of delay, only one claim is necessary.

If no schedule or agreement stating the dates upon which drawings shall be furnished is made, then no claim for delay shall be allowed on account of failure to furnish drawings until two weeks after demand for such drawings and not then unless such claim be

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reasonable.

This article does not exclude the recovery of damages for delay by either party under other provisions in the contract document. The amount of Contractor's delay damages shall be limited to the Costs, overhead and profit items enumerated in Article 16. Recovery of delay damages is conditioned upon compliance with the notice requirements of Article 17.

ARTICLE 20: CORRECTION OF WORK

The Contractor shall promptly remove from the premises all work condemned by the Designer as failing to conform to the contract, whether incorporated or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the contract and without expense to the Owner and shall bear the expense of making good all work of other Contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such condemned work within a reasonable time, fixed by written notice, the Owner may remove it and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten days time, thereafter, the Owner may, upon ten days written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor.

The Contractor shall remedy any defects due to faulty materials or workmanship and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of final payment, or from the date of the Owner's substantial usage or occupancy of the project, whichever is earlier, and in accordance with the terms of any special guarantees provided in the contract. The Owner shall give notice of observed defects with reasonable promptness. All questions arising under this article will be decided by the Designer, notwithstanding final payment.

ARTICLE 21: OWNER'S RIGHT TO DO WORK

If the Contractor should neglect to prosecute the work properly or fail to perform any provisions of this contract, the Owner, after three days written notice to the Contractor may, without prejudice to any other remedy may make good such deficiencies

and may deduct the cost thereof from the payment; then or thereafter due the Contractor, provided, however, that the Designer shall approve both such action and the amount charged to the Contractor.

ARTICLE 22: OWNER'S RIGHT TO TERMINATE CONTRACT

If the Contractor should be adjudged bankrupt, or if the Contractor should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account the Contractor's insolvency, or if the Contractor should persistently or repeatedly

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refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials or if the Contractor should fail to make prompt payment to Sub-Contractors or for material, or labor, or persistently disregard laws, ordinance or the instructions of the Designer, or otherwise be guilty of a substantial violation of any provision of the contract, then the Owner, upon the certificate of the Designer that sufficient cause exists to justify such action, may 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 Contractor and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method the Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract amount shall exceed the expense of finishing the work including compensation for additional Designer, managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred through the Contractor's default, shall be certified by the Designer.

ARTICLE 23: THE CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE CONTRACT

If the work should be stopped under an order of any court, or other public authority, for a period of thirty days, through no act or fault of the Contractor or of anyone employed by him, then the Contractor, may, upon seven days written notice to the Owner and the Designer, terminate this contract and recover from the Owner, payment for all work executed and any proven loss sustained upon any plant or materials and reasonable profit and damage.

Should the Designer fail to issue any certificate for payment, through no fault of the Contractor, within seven days after the Contractor's formal request for payment or if the Owner should fail to pay to the Contractor within 30 days after presentation, any sum certified by the Designer, then the Contractor may, upon seven days' written notice to the Owner and the Designer, stop the work or terminate this Contractor as set out in the preceding paragraph.

ARTICLE 24: PAYMENTS

The Contractor shall, before the first application for payment, submit to the Designer in triplicate a "contract cost breakdown" form acceptable to the Designer, if required, this form shall be supported by such evidence as to its correctness as the Designer may direct and, shall be reviewed by the Designer and unless found to be in error, used as a basis for payments.

The Contractor shall submit to the Designer an application for each payment on the latest revision of the BGS "Requisition for payment" form, and, if required, receipts or other vouchers, showing his payments of materials and labor, including payments to sub-Contractors as required by Article 34.

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Application for payment as the Work progresses may be made of the Owner but no more often than once a month, unless due to unusual circumstance the Owner may approve more frequent payment. Said requisition for payments shall be based on the proportionate quantities of the various classes of work completed or incorporated in the Work, in accordance with the Work progress schedule and the value thereof determined from the contract cost breakdown. Payments, upon authorization of the Designer, may be made on account of materials not incorporated in the Work but delivered and suitably stored at the site. Such payments shall be conditioned upon submission by the Contractor of bills of sale, or such other procedure as will adequately protect the Owner's interest including applicable insurance.

In the event any materials are delivered but not yet incorporated in the Work, have been included in any said "Requisition for Payment" and payment thereon made and said materials thereafter deteriorate, become damaged or destroyed or for any reason whatsoever become unsuitable or unavailable for use in the Work, then the full amount allowed therefore in any previous "Requisition for Payment", shall be deducted from the gross value of any subsequent payment or final payment unless the Contractor shall satisfactorily replace said material.

After said "Requisition for Payment" has been prepared by the Contractor in the required number of copies, it shall be submitted to the Designer for review. The Designer shall verify and approve the "Requisition for Payment", and forward all copies to the Owner for processing for payment by the Owner.

No certificate issued nor payment made to the Contractor, nor partial or entire use or occupancy of the Work by the Owner, shall be an acceptance of any Work or materials not in accordance with this contract. Except for those claims previously made by either party and still unsettled, the making and acceptance of the final payment shall constitute a waiver of all claims by the Owner, other than those arising from unsettled liens, those not complying with the requirements of the plans and specifications, those covered by warranties, and of all claims by the Contractor.

Title 5 M.R.S.A. Section 1746 as amended provides that in any contract awarded for any public improvement, the State shall withhold 5% of the money due the Contractor until the project under the contract has been accepted by or for the State, except that when the contract has been *substantially completed* the State may, upon request, further reduce the amounts withheld if it deems it desirable and prudent, or except when the Contractor elects to deposit with the Treasurer of the State certain Government Bonds as provided in Chapter 437, Public Laws of 1967.

With each monthly requisition the Contractor shall release and indemnify the owner from and against all liens on the project through the requisition date and shall supply partial lien waivers from all subcontractors through the date of the prior requisition.

All payments to be made in accordance with Title 10 MRSA Chapter 201-A "An Act to Ensure Prompt and Equitable Payment for Construction Services".

ARTICLE 25. PAYMENTS WITHHELD

The Designer may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any certificate to such extent as may be necessary in his reasonable opinion to protect the Owner from loss on account of:

- A. Defective work not remedied.
- B. Claims filed or reasonable evidence indicating probable filing of claims.
- C. Failure of the Contractor to make payments properly to Sub-Contractors for materials or labor.
- D. A reasonable doubt that the contract can be completed for the balance then unpaid.
- E. Damage to another Contractor.
- F. Damage to the premises or Work.
- G. Failure to carry out the Work in accordance with the Contract Documents.

When the above grounds are removed, payments shall be made for amounts withheld because of them.

ARTICLE 26. CONTRACTOR'S INSURANCE REQUIREMENTS

The Contractor shall not commence work under this contract until the Contractor has obtained all insurance required under this article and such insurance has been approved by the Owner, nor shall the Contractor allow any Sub-Contractor to commence work on a subcontract until all similar insurance required of the Sub-Contractor has been so obtained and approved.

The State and the Owner does not warrant or represent that the insurance required under this paragraph constitutes an insurance portfolio which adequately addresses all risks faced by the Contractor or its Sub-Contractors. The Contractor and Sub-Contractors of every tier shall satisfy themselves as to the existence, extent and adequacy of insurance prior to commencement of work.

The Contractor and any Sub-Contractor shall procure and maintain for the duration of the Project insurance of the types and limits set forth under this paragraph and such insurance as will protect themselves from claims which may arise out of or result from the Contractor's or Sub-Contractor's execution of the work, whether such execution be by themselves or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. The insurance coverage provided by the Contractor and any Sub-Contractor will be primary coverage. All required insurance coverages shall be placed with carriers authorized to conduct business in the State of Maine by the Maine Bureau of Insurance.

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A. Workers' Compensation Insurance

Worker's compensation insurance for all employees on site in accordance with the statutory 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.

B. Liability Insurance

1. General Liability Insurance

General liability insurance shall be on a form providing coverage not less than that of the 1996 occurrence version of the Insurance Services Office (ISO) Commercial General Liability Policy. This insurance shall cover 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. It shall include collapse and underground coverage - as well as explosion coverage if explosion hazards exist.

Aggregate limits shall apply on a per location or project basis.

Minimum acceptable limits are:

General aggregate limit:	\$2,000,000
Products and completed operations	\$1,000,000
Each occurrence limit:	\$1,000,000
Personal injury aggregate:	\$1,000,000

2. Automobile Liability Insurance

Automobile liability insurance against claims for bodily injury, death or property damage resulting from the maintenance, Ownership or use of all owned, nonowned and hired automobiles, trucks and trailers.

Minimum acceptable limit is \$1,000,000 any one accident or loss.

3. Owners Protective Liability

For Contracts exceeding \$50,000 in total Contract amount, Contractor shall secure an Owners Protective Liability policy naming the Owner as the Named Insured.

Minimum acceptable limits are:

General aggregate limit:	\$2,000,000
Each occurrence limit:	\$1,000,000

4. Pollution Liability

In the event that any disruption, handling, abatement, remediation, encapsulation, removal, transport, or disposal of contaminated or hazardous material is required, the

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Contractor or its Sub-Contractor shall secure a pollution liability policy in addition to any other coverages contained in this section. The insurance shall be provided on an occurrence based policy and shall remain in effect for the duration of the Project.

Minimum acceptable limit is \$1,000,000 per occurrence.

C. Property Insurance

Unless otherwise waived in writing by the Owner, the Contractor shall procure and maintain Builder's Risk insurance naming the Owner, Contractor and any Sub-Contractor 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 and coverage shall apply during the entire contract period and until the work is accepted by the Owner.

D. Certificates of Insurance

Four original copies of all certificates of insurance in a form and issued by companies acceptable to the Owner shall be provided to the Designer prior to commencement of work. The certificates shall name the Owner as certificate holder and shall contain a provision that coverage afforded under the insurance policies will not be canceled or materially changed unless at least thirty (30) days prior written notice by registered letter has been given to the Owner.

ARTICLE 27: CONTRACT BONDS

The Contractor shall furnish to the Owner and State upon execution of the contract, a contract performance bond and a contract payment bond; each for the full amount of the contract and issued by a surety company or surety companies authorized to do business in the State of Maine as approved by the Owner and State. The bonds shall be in accordance with and executed on the forms furnished in the specifications. The bonds shall allow for any addition or deductions to the contract.

The contract bonds shall continue in effect for the applicable periods limiting actions as provided by, as applicable, 14 MRSA Section 871 or Section 752 to protect the Owner's interest and to assure settlement of claims for the payment of all bills for labor, materials, and equipment by the Contractor.

The Contractor shall submit to the Bureau of General Services through the Designer, copies of the Contract Performance Bond and Contract Payment Bond for each of the Filed Sub-Bid Subcontractors that were required to submit Bid Bonds.

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ARTICLE 28: DAMAGES

1. The Contractor shall indemnify and hold harmless the Owner and the Designer and their agents and employees from and against all claims, damages, losses, and expenses including attorneys' fees arising out of or resulting from the performance of the work, provided that any such claim, damage, loss, or expense (a) is attributable to bodily injury sickness, disease or death, or injury to or destruction to tangible property (other than the work itself) including the loss of use resulting therefrom, and (b) is caused in whole or in part by a negligent act or omission of the Contractor, any Sub-Contractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

2. In any and all claims against the Owner or the Designer or any of their agents or employees, by any employee of the Contractor, any Sub-Contractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 1 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Sub-Contractor under Workmen's Compensation Acts, disability benefit acts, or other employee benefit acts.

3. The obligations of the Contractor under paragraph 1 shall not exceed the liability of the Designer, the Designer's agents or employees arising out of:

- (a) The preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications; or
- (b) The giving of or the failure to give directions or instructions by the Designer, the Contractor, agents or employees provided such giving or failure to give is the primary cause of the injury or damage.

ARTICLE 29: LIENS

Neither the final payment nor any part of the retained percentage shall become due until the Contractor, shall deliver to the Owner a complete release of all liens arising out of this contract, or receipts in full in lieu thereof, and, an affidavit that so far as the Contractor has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the Contractor, may if any Sub- Contractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify him against any lien. If any lien remains unsatisfied after all the payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien, including all cost and reasonable attorney's fee.

ARTICLE 30: ASSIGNMENT

Neither party to the contract shall assign the Contractor or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any money due or to become due to him hereunder, without the previous written consent of the Owner.

ARTICLE 31: MUTUAL RESPONSIBILITY OF CONTRACTORS

Should the Contractor cause damage to any separate Contractor on the work, the Contractor agrees, upon due notice, to settle with such Contractor by agreement or arbitration, if he will so settle. If such separate Contractor sues the Owner or Designer on account of any damage alleged to have been so sustained, the Owner or Designer shall notify the Contractor, who shall defend such proceedings at the Contractor's expense and if any judgment against the Owner or Designer arises therefrom, the Contractor shall pay or satisfy it and pay all costs incurred by the Owner or Designer.

ARTICLE 32: SEPARATE CONTRACTS

The Owner reserves the right to let other contracts in connection with this work under similar general conditions. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

If any part of the Contractor's work depends on proper execution or results upon the work of any other Contractor, the Contractor shall inspect and promptly report to the Designer any defects in such work that render it unsuitable for such proper execution and results. The Contractor's failure so to inspect and report shall constitute an acceptance of the other Contractor's work as fit and proper for the reception of his work, except as to defects which may develop in Contractor's work after the execution of the Contractor's work.

To insure the proper execution of the Contractor's subsequent work the Contractor shall measure work already in place and shall at once report to the Designer any discrepancy between the executed work and the drawings.

ARTICLE 33: SUBCONTRACTS

The Contractor shall not sublet any part of this contract without the written permission of the Owner.

The Contractor shall submit in writing to the Designer for approval a complete list of the names of all particular items of work he proposes to furnish and the names of the Sub-Contractors to whom the Contractor proposes to sublet work. The Sub-Contractors named shall be reputable firms of recognized standings with a record of satisfactory work. The Contractor shall not employ any Sub-Contractor or use any material that requires approval by any Specification Section until they have been approved, or where there is reason to believe the work will not be accomplished in accordance with the contract documents. The complete list of Sub-Contractors and materials must be submitted for approval to the Designer and

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Owner.

The Designer shall, on request, furnish to any Sub-Contractor, wherever practicable, evidence of the amounts certified on his account.

The Contractor agrees that he is as fully responsible to the Owner for the acts and omissions of his Sub-Contractor and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

Nothing contained in the contract documents shall create any contractual relation between any Sub-Contractor and the Owner.

ARTICLE 34: RELATIONS OF CONTRACTOR AND SUB-CONTRACTOR

The Contractor agrees to bind every Sub-Contractor and every Sub-Contractor agrees to be bound by the terms of the contract documents, as far as they are applicable to his work, including the following provisions of this article, unless specifically noted to the contrary in a subcontract approved in writing as adequate by the Owner or Designer.

The Sub-Contractor agrees:

- A. To be bound to the Contractor by the terms of the contract documents, and to assume toward the Contractor all the obligations and responsibilities that the Contractor, by those documents, assumes toward the Owner.
- B. To submit to the Contractor applications for payment in such reasonable time as to enable the Contractor to apply for payment as specified.
- C. To make all claims for extras, for extensions of time and for damages for delays or otherwise, to the Contractor in the manner provided in the general conditions for like claims by the Contractor upon the Owner, except that the time for making claims for extra cost is one week.

The Contractor agrees:

- D. To be bound to the Sub-Contractor by all the obligations that the Owner assumes to the Contractor under the contract documents, and by all the provisions thereof affirming remedies and redress to the Contractor from the Owner.
- E. To pay the Sub-Contractor, upon the payment of certificates, the amount allowed to the Contractor on account of the Sub-Contractor's work to the extent of the Sub-Contractor's interest therein.
- F. To pay the Sub-Contractor, upon the payment of certificates, if issued otherwise as in section E above, so that at all times the Sub-Contractor's total payments shall be as large in proportion to the value of the work done by the Sub-

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Contractor.

G. To pay the Sub-Contractor to such extent as may be provided by the contract Documents or the subcontract, if either of these provide for earlier or larger payments than the above.

H. To pay the Sub-Contractor on demand for subcontract work or materials as far as executed and fixed in place, less the retained percentage, at the time the certificate should issue, even though the Designer fails to issue it for any cause not the fault of the Sub-Contractor.

I. To make no demand for liquidated damages or penalty for delay in any sum in excess of such amount as may be specifically named in the subcontract.

J. That no claim for services rendered or materials furnished by the Contractor to the Sub-Contractor shall be valid unless written notice thereof is given by the Contractor to the Sub-Contractor during the first ten days of the calendar month following that in which the claim originated.

K. To give the Sub-Contractor an opportunity to present and to submit evidence in any progress conference or disputes involving subcontract work.

L. To pay the Sub-Contractor a just share of any fire insurance money received by him, the Contractor, under Article 26 of the General Conditions.

ARTICLE 35: DESIGNER'S STATUS

The Designer shall be the Owner's representative during the construction period and he shall observe the work in progress on behalf of the Owner. He shall have authority to act on behalf of the Owner only to the extent expressly provided in the contract documents or otherwise in writing, which shall be shown to the Contractor. He shall have authority to stop the work whenever such stoppage may be necessary in his reasonable opinion to insure the proper execution of the contract.

The Designer shall be, in the first instance, the interpreter of the conditions of the contract and the judge of its performance. The Designer shall side neither with the Owner nor with the Contractor, but shall use the Designer's powers under the contract to enforce its faithful performance by both.

In case of the termination of the employment of the Designer, the Owner shall appoint a capable and reputable Designer whose status under the contract shall be that of the former Designer.

ARTICLE 36: CASH ALLOWANCES

The Contractor shall include the contract sum and all allowances named in the contract documents and shall cause the work so covered to be done by such Contractors and for such

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sums as the Designer may direct, the contract amount being adjusted in conformity therewith. The Contractor declares that the contract amount includes such sums for expenses and profit on account of cash allowances, as he deems proper. No demand for expenses or profit other than those included in the contract shall be allowed. The Contractor shall not be required to employ for any such work, persons against whom the Contractor has a reasonable objection.

ARTICLE 37: USES OF PREMISES

The Contractor shall confine his apparatus; the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the Designer, and as required by the Contract Documents, and shall not unreasonably encumber the premises with his materials.

The Contractor shall not load or permit any part of the structure to be loaded with a weight which will endanger its safety. The Contractor shall enforce the Designer's instructions regarding signs, advertisements, fires, and smoking.

If any part of the building is completed and ready for occupancy, the Owner may, by written and mutual consent, without prejudice to any of the Owner's rights or the rights of the Contractor enter in and make use of such completed parts of the building. Such use or occupancy shall in no case be construed as an acceptance of any work or materials.

ARTICLE 38: CUTTING, PATCHING AND DIGGING

The Contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other Contractors shown upon, or reasonable implied by, the drawings and specifications for the completed structure, and he shall make good after them as the Designer may direct.

Any cost caused by defective or ill-timed work shall be borne by the party responsible therefore. The Contractor shall not endanger any work by cutting, excavating or otherwise, and shall not cut or alter the work of any other Contractor save with the consent of the Designer. Cutting, drilling, or patching work of Contractors other than the general Contractor shall be done only with the permission and instruction of the general Contractor and Designer. Cutting of structural members must be approved by the Designer. All cutting, patching, and digging of other Contractors in or about the building shall be done under the supervision of the general Contractor who shall be responsible to see that the work is neatly done, and in a manner that will not endanger the structure or harm the component parts, and that patching and back filling shall be done to restore the structure and surfaces to its original condition.

ARTICLE 39: LAYOUT OF WORK

The Contractor shall be responsible for the correct staking out of the new work on the site, and shall employ a competent engineer/surveyor to locate the building on the site. He shall run the axis lines locating the work, establish correct datum points, and check each line

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and point on the site to insure their correctness. All such lines and points shall be carefully preserved throughout the construction.

The Contractor shall lay out all work from dimensions given on plans. The Contractor shall take measurements and verify dimensions of existing or old work, if any, that affect his work or to which his work is to be fitted. The Contractor alone shall be responsible for the correctness of all measurements and shall verify all grades, lines, levels, elevations and dimensions shown on the drawings and report any errors or inconsistencies to the Designer prior to commencing work.

ARTICLE 40: WORKMANSHIP

All workmanship, materials or equipment, either at the site or intended for it shall conform with all respects with the requirements of all the contract documents, and shall be strictly first class, workmanlike installation and the best obtainable from the crafts and trades. Incomplete or careless workmanship will not be allowed. In all cases the materials, equipment and work shall be equal to or better than the grade specified and the best of their kind that is obtainable for the purpose for which they are intended. The Designer's decision on the quality of work shall be final.

All labor shall be performed by mechanics skilled in their respective trades. Prior to submitting a proposal, the Contractor shall become familiar with the local labor conditions, skilled and unskilled.

If, in the opinion of the Contractor, any work is indicated on the drawings or specified in such manner as would make it impossible to produce work of the highest quality, or should discrepancies appear between drawings, or drawings and specifications, the Contractor shall refer the same in writing to the Designer for interpretation before proceeding with the work.

If the Contractor fails to make such reference, no excuse will be entertained thereafter for failure to carry out the work in the satisfactory manner.

The Contractor shall guarantee the Contractor's work against any defects in workmanship and materials for a period of one year from the date of the written final acceptance of the project.

ARTICLE 41: CLEANING UP

The Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his employees or work, and at the completion of the work he shall remove all his rubbish from and about the building and all his tools, scaffolding and surplus materials and shall leave his work "Broom Clean" or its equivalent, unless more exactly specified.

In case of failure to comply by the Contractor, the Owner may perform the cleanup and deduct the cost from any monies due the Contractor.

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ARTICLE 42: DISPUTE RESOLUTION

If, in the performance of this contract, there arises a dispute between the Contractor and the Owner that cannot be resolved by the parties to the contract, the dispute shall be referred to the Director of the Bureau of General Services who, at his/her discretion, will submit the dispute to non-binding Alternate Dispute Resolution (ADR) or binding arbitration. If the parties in dispute are not satisfied with the results of ADR the Owner or the Contractor may resubmit the dispute to the Director of the Bureau of General Services for binding arbitration.

In any non-binding Alternative Dispute Resolution (ADR) or binding arbitration between the Owner and the Contractor, the Owner may elect to consolidate related claims between the Owner and the Designer. Any mediator and/or arbitrator shall be subject to the mutual approval of the Owner, the Contractor and, as applicable, the Designer, such approval not to be unreasonably withheld by any party.

ARTICLE 43: COMPLETION TIME AND LIQUIDATED DAMAGES

a) The Date(s) of Completion is stated in the Proposal Form Section 2-B and in the Contract Form Section 2-E. If the Contractor finds it impossible to complete the Work on or before the said Date(s) of Completion, he make a written request to the Owner for an Extension of Time setting forth therein the reasons for the request. If the Owner finds that the Work was delayed because of conditions beyond the control and without the fault of the Contractor he may extend the Date(s) of Completion which will then be in full force and effect, the same as though it was the original Date(s) of Completion. b) Time is an essential element of the Contract and it is important the Work be pressed vigorously to Completion. The cost to the Owner of Administration of the Contract, inspection and supervision will be increased as the time occupied in the Work, is lengthened. c) For each calendar day that the Work shall remain uncompleted after the Date(s) of Completion specified in the Contract, the amount per day, listed below in the Schedule of Liquidated damages, shall be deducted from any money due the Contractor, not as a penalty but as liquidated damages, provided, however that due account shall be taken of any adjustment of the Date(s) of Completion granted under the provisions of Paragraph (a) above. d) The Contractor shall expressly be prohibited from filing delay claims or attempting to recover damages for its scheduled early completion. The Owner and Designer have not requested accelerated schedules and cannot accommodate the Contractor if he chooses to accelerate the Work. The Owner and Designer have designed the Project to be done in an orderly fashion which allows for bad weather, minor changes in the Work, and an orderly submittal and review process of materials and workmanship. Any Contractor choosing to bid the project with accelerated completions, earlier than those allowed by the phasing plan, has a duty to inform the project owner of the Contractor's intention to achieve early completion and he shall also note early completion as a qualification on his bid form. The Owner reserves the right to reject all bids containing limitations or qualifications.

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SCHEDULE OF LIQUIDATED DAMAGES

<u>Damages</u>	<u>Amount of Liquidated Per Day</u>
<u>Original Contract Amount</u>	
More than \$ 100,000 and less than \$ 3,000,000	\$ 750.00
More than \$ 3,000,000 and less than \$ 7,000,000	\$ 1000.00
More than \$ 7,000,000 and less than \$ 10,000,000	\$ 1500.00
More than \$ 10,000,000	\$ 1500.00 plus \$ 150 per \$ 1,000,000

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3-B - SUPPLEMENTARY CONDITIONS

These Supplementary Conditions supplement and, as applicable, amend The State of Maine Standard General Conditions and Contract Work for Public School Projects (the "General Conditions").

1. The parties recognize that the Project is locally funded, and that the role of the Bureau of General Services for locally funded projects is primarily advisory. Accordingly, notwithstanding anything to the contrary in the contract documents, submission to or review or approval by the Bureau of General Services shall not be required, except to the extent such submission, review or approval is required by state law or regulation for locally funded school construction projects. Furthermore, wherever used in the contract documents, "Bureau" and "Bureau of General Services" shall mean the Owner, unless the specific provision of the contract documents is in fulfillment of a state law or regulation that must be complied with in the case of a locally funded school construction project.
2. Revise the sixth paragraph of ARTICLE 9 to read "The Contractor warrants and guarantees his work against any defects in workmanship and materials for a period of one year from the date of the written acceptance of the project.
3. Revise last sentence in the first paragraph of Article 19 to read "Inclement weather or other natural causes shall not be reason to allow additional time under this contract, with the exception of tornado, earthquake, flood, or similar event that causes catastrophic damage and delay."
4. The release of liens required by Article 24, Payments, of the General Conditions shall be in the form of Exhibit A and Exhibit B to these Supplementary Conditions. Final lien waiver and accompanying affidavit required by Article 29, Liens, shall be substantially in the form of AIA Documents G706 and G706A and shall be accompanied by final releases of lien for each subcontractor and supplier as specified therein. Final releases for each Phase shall be submitted by the Contractor upon final completion of each of Phase 1 and of Phase 2, respectively.
5. ARTICLE 26: CONTRACTOR'S INSURANCE REQUIREMENTS, Paragraphs A, B, C and D are deleted in their entirety and replaced with the following:

A. Workers' Compensation Insurance

Worker's compensation insurance for all employees on site in accordance with the statutory workers' compensation law of the State of Maine. (Provide Owner as Additional Insured and Waiver of Subrogation endorsements if available from the insurance carrier)

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.

B. Liability Insurance

1. General Liability Insurance

General liability insurance shall be on a form providing coverage not less than that of the Insurance Services Office (ISO) Commercial General Liability Policy, CG 00 01 12 04, Endorsements: CG 2010 – Additional Insured (naming the City and School Dept.), CG2503- General Aggregate Per Project, and CG2404 (if not included in form) Waiver of Transfer of Rights of recovery. This insurance shall cover 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. It shall include collapse and underground coverage as well as explosion coverage if explosion hazards exist. Aggregate limits shall apply on a per 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

2. Automobile Liability Insurance

Automobile liability insurance against claims for bodily injury, death or property damage resulting from the maintenance, Ownership or use of all owned, nonowned and hired automobiles, trucks and trailers.

Minimum acceptable limit is \$1,000,000 any one accident or loss.

3. Owners Protective Liability

For Contracts exceeding \$50,000 in total Contract amount, Contractor shall secure an Owners Protective Liability policy naming the Owner as the Named Insured.

Minimum acceptable limits are:

General aggregate limit:	\$2,000,000
Each occurrence limit:	\$1,000,000

4. Pollution Liability

In the event that any disruption, handling, abatement, remediation, encapsulation, removal, transport, or disposal of contaminated or hazardous material is required, the Contractor or its Sub-Contractor shall secure a pollution liability policy in addition to any other coverages contained in this section. The insurance shall be provided on an occurrence based policy and shall remain in effect for the duration of the Project. If not available and a claims made policy is provided, include an extended reporting period of three years after project completion.

Minimum acceptable limit is \$1,000,000 per occurrence.

5. Commercial Umbrella/Excess Liability Insurance: \$10,000,000

C. Property Insurance

The Owner will provide the Builder's Risk insurance.

D. Certificates of Insurance

Four original copies of all certificates of insurance in a form and issued by companies acceptable to the Owner shall be provided to the Designer prior to commencement of work. The Owner shall be listed on the certificates as an additional insured, and certificate shall include Waiver of Subrogation in favor of the Owner. The certificates shall name the Owner as certificate holder and shall contain a provision that coverage afforded under the insurance policies will not be canceled or materially changed unless at least thirty (30) days prior written notice by registered letter has been given to the Owner. Cancellation Notice of 30 days shall be specifically endorsed to the policies."

7. ARTICLE 42: DISPUTE RESOLUTION, is deleted in its entirety and replaced with the following:

"ARTICLE 42: DISPUTE RESOLUTION

If, in the performance of this contract, there arises a dispute between the Contractor and the Owner that cannot be resolved by the parties to the contract, the parties shall submit the dispute to

a single mediator selected by parties. The parties agree to mediate the dispute in good faith for not more than one day at a date, time and place in Cumberland County, Maine specified by the mediator. The parties shall equally share the costs and fees of the mediator, but shall otherwise bear their own costs of mediation. If the parties are unable to agree upon a mediator or otherwise fail to resolve their differences through mediation, then either party may demand arbitration pursuant to the Maine Uniform Arbitration Act, 14, M.R.S.A. §5927-5949. There shall be one arbitrator selected by the parties. If the parties cannot agree upon an arbitrator within thirty (30) days of a demand for arbitration, then either party may apply to Maine Superior Court for selection of an arbitrator. The arbitrator selected shall conduct the arbitration proceeding. All issues which relate to the controversy or dispute shall be resolved in the arbitration, which shall be final and binding provided that in any arbitration the arbitrator shall be bound by and follow the substantive laws of Maine. The arbitration hearing shall be conducted in Maine and shall not exceed two days unless agreed by the parties or ordered by the arbitrator. The parties shall equally share the costs and fees of the arbitrator, but shall otherwise bear their own costs of arbitration except that if the arbitrator determines that either party has acted unreasonably or in bad faith, the arbitrator may require that party to reimburse the other party for its reasonable costs, including but not limited to arbitration costs and reasonable attorney's fees. In any binding arbitration between the Owner and the Contractor, the Owner may elect to consolidate related claims between the Owner and the Designer, in which case the selection of the arbitrator shall also be subject to approval of the Designer.”

8. **ARTICLE 43: COMPLETION TIME AND LIQUIDATED DAMAGES**

The Owner shall be entitled to actual damages if Owner's actual damages exceed the liquidated damages provided by Article 43 of the General Conditions.

SECTION 3 - B

**EXHIBIT A
PARTIAL LIEN WAIVER**

The undersigned, _____ as Contractor under a Contract by and between the undersigned and the York School Department (“Owner”), has furnished or caused to be furnished labor or materials, or both, for the premises owned by Owner and located on or about York School Department Mechanical Upgrades Project, York, ME (“Premises”); and

The undersigned hereby certifies to the Owner that through the date set forth below, the sum of \$ _____ is now due and payable to the undersigned, with retainage due but not yet payable, in the amount of \$ _____ and with a balance of \$ _____ due upon completion (or as it becomes due) of the Contract by and between the undersigned and Owner, and

The undersigned certifies to the Owner that all subcontractors or suppliers of labor, services, material or equipment used, engaged or employed by the undersigned directly or indirectly, have been paid in full, or shall immediately be paid in full from the payment requisition submitted to Owner herewith, with respect to the labor materials furnished to the Premises through the date set forth below; and

The undersigned further certifies that the attached hereto are partial Lien Waivers obtained by the undersigned from all subcontractors or suppliers for whose work or materials partial payment is to be made from the payment requisition submitted herewith or who are otherwise entitled to payment and the undersigned hereby agrees to indemnify and hold Owner harmless from any and all claims by any party whatsoever in connection with the labor or materials furnished, caused to be furnished or intended to be furnished by or on behalf of the undersigned through the date set forth below; and

The undersigned does hereby acknowledge full performance by the Owner of all obligations due or owing to the undersigned in connection with the Premises and the project through the date set forth below; does hereby release the Owner of all claims, demands and actions arising out or in connection with the Premises and project through the date set forth below; and does hereby waive and release any lien or right to lien the Premises, including any building improvements, on account of any and all labor or materials, or both furnished for or incorporated into the Premises through the date set forth below.

Dated

Dated

Witness

Contractor

State of Maine
County of _____

Then personally appeared before me the above-named Contractor and acknowledged the foregoing to be a free act and deed.

Notary Public

Dated

Print Name

Note: This Partial Lien Waiver and all attached Partial Lien Waivers from subcontractors and suppliers must be dated not more than ten (10) days before Contractor’s payment requisition.

SECTION 3 - B

**EXHIBIT B
PARTIAL LIEN WAIVER
(Subcontractor and Suppliers)**

The undersigned, _____ pursuant to a Contract or Agreement with _____ (“Contractor”), has furnished or caused to be furnished labor or materials, or both, for the premises owned by the York School Department and located on or about the York School Department Mechanical Upgrades Project, York, ME (“Premises”); and

The undersigned hereby certifies to the Owner that through the date set forth below, the sum of \$ _____ is now due and payable to the undersigned, with retainage due but not yet payable, in the amount of \$ _____ and with a balance of \$ _____ due upon completion (or as it becomes due) of the Contract or Agreement with the Contractor; and upon receipt of the sums now due the undersigned shall and does hereby release the Contractor from all claims, demands and actions on account of labor or materials to or for the Premises through the date set forth below; and

The undersigned certifies to the Owner that all Contractor that all subcontractors or suppliers of labor, services, material or equipment used, engaged or employed by the undersigned directly or indirectly, have been paid in full, or otherwise satisfied with respect to labor or materials furnished to the Premises through the date set forth below; and the undersigned hereby agrees to indemnify and hold the Owner and Contractor harmless from any and all claims by any party whatsoever in connection with the labor or materials furnished by the undersigned; and

The undersigned does hereby acknowledge full performance by the Owner of all obligations due or owing to the undersigned in connection with the Premises and the project through the date set forth below; does hereby release the Owner of all claims, demands and actions arising out or in connection with the Premises and project through the date set forth below; and does hereby waive and release any lien or right to lien the Premises, including any building improvements, on account of any and all labor or materials, or both furnished for or incorporated into the Premises through the date set forth below.

Dated

Dated

Witness

Subcontractor / Supplier

By: Its

Note: This Partial Lien Waiver and all attached Partial Lien Waivers from subcontractors and suppliers must be dated not more than ten (10) days before Contractor’s payment requisition.

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SECTION 011000 – SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Work covered by the Contract Documents.
 - 2. Type of the Contract.
 - 3. Work schedule.
 - 4. Work under other contracts.
 - 5. Owner-furnished products.
 - 6. Owner's occupancy requirements.
 - 7. Specification formats and conventions.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: York School Department Mechanical Upgrades.
 - 1. Project Location: York, Maine.
- B. Owner: York School District.
- C. Architect: Harriman, Auburn Business Park, 46 Harriman Drive, Auburn, ME 04210.

1.4 TYPE OF CONTRACT

- A. Project will be constructed under a single prime contract.

1.5 WORK SCHEDULE

- A. Schedule:
 - 1. Work may begin on June 23, 2022 and all work shall be substantially complete on or before August 26, 2022.
- B. Do not disturb adjacent spaces during hours of operation.
- C. Time: The term “day” as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

1.6 OWNER-FURNISHED PRODUCTS

- A. Owner will furnish products indicated and /or as specified. The Work includes providing support systems to receive Owner's equipment.
 - 1. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
 - 2. Contractor shall install and otherwise incorporate Owner-furnished items into the Work.

1.7 OWNER'S OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: Owner will occupy site and premises during entire construction period with the exception of areas under construction. 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 authorities having jurisdiction.
 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

1.8 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the CSI/CSC's "MasterFormat" numbering system.
1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
 2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.
- B. 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. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. 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.

1.9 MISCELLANEOUS PROVISIONS

- A. Material safety data sheets shall be made available in accordance with OSHA requirements.
- B. No asbestos containing materials shall be used in the work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

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SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.
 - 2. Hold pricing for 45 days from date of bid to allow Owner time for project accounting. Alternates not accepted before contract signing may be added by Change Order later.

1.4 PROCEDURES

- A. Coordination: Modify 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 modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate #1: All project scope within York High School.

1. ADD AMOUNT: _____

END OF SECTION 012300

SECTION 230900 – INSTRUMENTATION AND CONTROL FOR MECHANICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Direct Digital Control (DDC) equipment.
- B. Software.
- C. Installation.

1.2 REFERENCES

- A. U.S. Department of Justice – 2010 ADA Standards for Accessible Design.
- B. ASME MC85.1 - Terminology for Automatic Control.
- C. NEMA EMC1 - Energy Management Systems Definitions.
- D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- E. NFPA 70 - National Electrical Code.
- F. NFPA 90A - Installation of Air Conditioning and Ventilation Systems.

1.3 SYSTEM DESCRIPTION

- A. A fully integrated Automatic Temperature Control (ATC) Building Management and Control System incorporating Direct Digital Control (DDC), energy management, equipment monitoring, and control consisting of the following:
 - 1. Microcomputer-based equipment controllers interfacing directly with sensors, actuators and environmental delivery systems.
 - 2. Electric controls and mechanical devices for items indicated on Drawings and described hereinafter including dampers, valves, and motor drives.
 - 3. Microcomputer-based terminal controllers interfacing with sensors, actuators, and terminal equipment control devices.
- B. Submittals, data entry, electrical installation, programming, start up, test and validation, instruction of Owner's representative on maintenance and operation, as built documentation, and system warranty.
- C. System Summary:
 - 1. The intent of this project is to upgrade the existing AX supervisor front end interface to N4 platform.
 - 2. Create new graphics and hardware points, including, but not limited to, building network communications controllers, hot water heating boilers and associated pumps, heat and ventilation units, air-to-air heat exchangers, unit ventilators, reheat coils, and hot water fin tube radiation.
 - a. Equipment above to have new DDC controller and new sensors furnished and installed.

- b. Verification compatibility of existing controls to remain with new DDC.
 - c. Replacement of non-compatible and non-functioning existing controls on equipment with scope of work.
- D. Note: The terms “BMS”, “ATC”, and “DDC” are used somewhat interchangeably throughout this Section.

1.4 DEFINITIONS

- A. Note: The terms ATC, BAS, and DDC may be used interchangeably in this Section and on the Drawings, to indicate the overall control system.
- B. Definitions:
- 1. ATC: Automatic temperature control.
 - 2. BACnet: A control network technology platform for designing and implementing interoperable control devices and networks.
 - 3. BAS: Building Automation System.
 - 4. DDC: Direct digital control.
 - 5. I/O: Input/output.
 - 6. MS/TP: Backnet IP/ethernet.
 - 7. PC: Personal computer.
 - 8. PID: Proportional plus integral plus derivative.
 - 9. RTD: Resistance temperature detector.

1.5 SYSTEM PERFORMANCE

- A. Comply with the following performance requirements:
- 1. Graphic Display: Display graphic with minimum 20 dynamic points with current data within 10 seconds.
 - 2. Graphic Refresh: Update graphic with minimum 20 dynamic points with current data within 8 seconds.
 - 3. Object Command: Reaction time of less than two seconds between operator command of a binary object and device reaction.
 - 4. Object Scan: Transmit change of state and change of analog values to control units or workstation within six seconds.
 - 5. Alarm Response Time: Annunciate alarm at workstation within 45 seconds.
 - 6. Program Execution Frequency: Run capability of applications as often as five seconds, but selected consistent with mechanical process under control.
 - 7. Performance: Programmable controllers shall execute DDC PID control loops, and scan and update process values and outputs at least once per second.
 - 8. Reporting Accuracy and Stability of Control: Report values and maintain measured variables within tolerances as follows:
 - a. Water Temperature: Plus or minus 1 deg F (0.5 deg C).
 - b. Water Flow: Plus or minus 5 percent of full scale.
 - c. Water Pressure: Plus or minus 2 percent of full scale.
 - d. Space Temperature: Plus or minus 1 deg F (0.5 deg C).
 - e. Ducted Air Temperature: Plus or minus 1 deg F (0.5 deg C).
 - f. Outside Air Temperature: Plus or minus 2 deg F (1.0 deg C).
 - g. Dew Point Temperature: Plus or minus 3 deg F (1.5 deg C).
 - h. Temperature Differential: Plus or minus 0.25 deg F (0.15 deg C).
 - i. Relative Humidity: Plus or minus 5 percent.

1.6 SUBMITTALS

- A. Qualification Data: For Installer and manufacturer.
- B. Product Data: Include manufacturer's technical literature for each control device. Indicate dimensions, capacities, performance characteristics, electrical characteristics, finishes for materials, and installation and startup instructions for each type of product indicated.
 - 1. Hardware: Bill of materials of equipment indicating quantity, manufacturer, and model number. Include technical data for control units, transducers/transmitters, sensors, actuators, valves, relays/switches, control panels, and operator interface equipment.
 - 2. Controlled Systems: Instrumentation list with element name, type of device, manufacturer, model number, and product data. Include written description of sequence of operation including schematic diagram.
- C. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 1. Bill of materials of equipment indicating quantity, manufacturer, and model number.
 - 2. Schematic flow diagrams showing fans, coils, dampers, valves, and control devices.
 - 3. Wiring Diagrams: Power, signal, and control wiring.
 - 4. Details of control panel faces, including controls, instruments, and labeling.
 - 5. Written description of sequence of operation.
 - 6. Schedule of existing dampers including size, leakage, and flow characteristics.
 - 7. Schedule of existing valves including size and flow characteristics.
 - 8. DDC System Hardware:
 - a. Wiring diagrams for control units with termination numbers.
 - b. Schematic diagrams and floor plans for field sensors and control hardware.
 - c. Schematic diagrams for control, communication, and power wiring, showing trunk data conductors and wiring between operator workstation and control units.
 - 9. Control System Software: List of color graphics indicating monitored systems, data (connected and calculated) point addresses, output schedule, and operator notations.
 - 10. Controlled Systems:
 - a. Schematic diagrams of each controlled system with control points labeled and control elements graphically shown, with wiring.
 - b. Scaled drawings showing mounting, routing, and wiring of elements including bases and special construction.
 - c. Written description of sequence of operation including schematic diagram.
- D. Data Communications Protocol Certificates: Certify that each proposed DDC system component complies with the open protocol standard compatible with the Owner's existing Delta system, ASHRAE Standard 135 (BACnet).
- E. Software and Firmware Operational Documentation: Include the following:
 - 1. Software operating and upgrade manuals.
 - 2. Program Software Backup: On a magnetic media or CD, complete with data files.
 - 3. Device address list.
 - 4. Printout of software application and graphic screens.
- F. Field quality-control test reports.
- G. Operation and Maintenance Data.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Division 01 Section "Operation and Maintenance Data."
- B. For mechanical instrumentation and control system to include in emergency, operation, and maintenance manuals.
- C. In addition to items specified in Division 01, include the following:
 - 1. Maintenance instructions and lists of spare parts for each type of control device.
 - 2. Exploded assembly views.
 - 3. Interconnection wiring diagrams with identified and numbered system components and devices.
 - 4. Inspection period, cleaning methods, cleaning materials recommended, and calibration tolerances.
 - 5. Calibration records and list of set points.
- D. Manuals: Provide the following:
 - 1. An Operator's Manual with graphic explanations of keyboard use for operator functions specified under Operator Training.
 - 2. Computerized printouts of equipment controller's data file construction including point processing assignments, physical terminal relationships, scales and offsets, command and alarm limits, and others as applicable.
 - 3. A manual including revised as-built documents of materials required under the paragraph "SUBMITTALS" in this Specification Section.
 - 4. Provide the quantity of manuals specified in Division 01, and at least 2 Operator's Manuals and 2 As-Built Manuals to the Owner. Refer to other Sections of the Specifications for project requirements for quantities of documentation.

1.8 CODES AND APPROVALS

- A. The complete temperature control installation shall be in strict accordance to the national and local electrical codes and the electrical Division of these Specifications. Devices designed for or used in line voltage applications shall be UL listed. Microprocessor based remote and central devices shall be UL916 Listed.
- B. Electronic equipment shall conform to the requirements of FCC regulation Part 15, Section 15 governing radio frequency electromagnetic interference and be so labeled.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: Automatic control system manufacturer's authorized representative who is trained and approved for installation of system components required for this Project.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with ASHRAE Standard 135 (BACnet) for DDC system components.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Division 01 Section "Project Requirements."
- B. Factory-Mounted Components: Where control devices specified in this Section are indicated to be factory mounted on equipment, provide shipping of control devices to equipment manufacturer, in a timely manner coordinated with the equipment manufacturer.
- C. Components to be Installed under Other Sections: For components to be installed under other Sections of the Specifications, provide delivery of components to appropriate Subcontractors, provide installation instructions, and supervise their installation.

1.11 COORDINATION

- A. Coordinate location of thermostats and other exposed control sensors with Contract Drawings before installation.
- B. Coordinate equipment with Division 26 and existing fire alarm system to achieve compatibility with equipment that interfaces with that system.
- C. Coordinate line-voltage power supplies with Division 26.

1.12 WARRANTY

- A. Components, system software, parts, and assemblies furnished under this Section shall be guaranteed against defects in materials and workmanship for 1 year from acceptance date.
- B. Labor to troubleshoot, repair, reprogram, or replace system components shall be provided at no charge to the Owner during the warranty period.
- C. Corrective software modifications made during warranty service periods shall be updated on user documentation and on user and manufacturer archived software disks.

PART 2 - PRODUCTS

2.1 ACCEPTABLE SUPPLIERS

- A. Acceptable Manufacturers and Required Programmer:
 - 1. Honeywell Controls, Honeywell Inc. – Installed by Contractor
- B. The Temperature Control Contractor (or Subcontractor) shall hereinafter be referred to as the ATC Contractor.

2.2 SYSTEM REQUIREMENT

- A. Provide complete direct digital and electronic control system consisting of temperature sensors, thermostats, control valves, dampers, operators, indicating devices, interface equipment, and other apparatus required to operate mechanical system and to perform functions specified. Provide controls for the following:
1. Air moving and handling systems.
 2. Boilers, furnaces, and fuel-fired equipment.
 3. Combustion air systems.
 4. Control dampers and valves.
 5. Cooling and heating coils.
 6. Cooling and heating terminal units.
 7. Exhaust, return, and supply fans.
 8. Filter pressure drops.
 9. Heat recovery systems.
 10. Outside air and ventilation.
 11. Temperature and humidity monitoring.
 12. Hot water heating systems.
 13. Graphical workstation.
 14. Variable frequency drives for pumps and fans.
 15. Provide hardware and software required for remote monitoring of the ATC system through modem or ethernet interface.

2.3 DATA INPUTS AND OUTPUTS

- A. Input/output sensors and devices shall be closely matched to the requirements of the remote panel for accurate, responsive, noise-free signal input/output. Control input response shall be high-sensitivity and matched to the loop gain requirements for precise and responsive control.
- B. Duct temperature sensors shall be rigid stem or averaging type as required. Provide water sensors with a separable copper, monel or stainless-steel well.
- C. Control relays and analog output transducers shall be compatible with equipment controllers output signals. Relays shall be suitable for the loads encountered. Analog output transducers shall be designed for precision closed loop control with pneumatic repeatability error no greater than 1/2 percent.
- D. Data inputs and outputs shall be compatible with variable frequency drives; see Division 23 Section "Common Motor Requirements for HVAC Equipment."

2.4 TEMPERATURE CONTROL CENTRAL HARDWARE

- A. Operator Workstations: The central operator workstations is existing to remain.

2.5 OPERATOR STATION SOFTWARE

- A. Operator Station (OS) software shall include as a minimum the Operating System, Data Base Manager, Communications Control, Operator Interface , Trend and History Files, Report Generator, and Support Utilities.
1. Real time operating system shall be true multi-tasking providing concurrent execution of multiple real time programs and custom program development.

2. Data Base manager is to manage data on an integrated and non-redundant basis. It shall allow additions and deletions to the data base without any detriment to the existing data.
- B. Operator Interface Software:
1. Operator access to the system is to be under personal ID and password control for up to 100 unique operators.
 2. Up to 100 frequently addressed system points shall be definable as "quick access" points. Each points user address, descriptor, and value/status shall be displayed.
 3. Software capacity and user's license shall be unlimited in the quantity of points and tags it can accommodate. Owner shall be able to add points and tags without purchasing additional software or licensing.
 4. Points (physical and pseudo) shall be displayed with dynamic data provided by the system with appropriate text descriptors, status or value, and engineering unit. Points shall be dynamic and shall continuously update anytime their field status/value changes.
 5. An on-line context-sensitive help utility shall be provided to facilitate operator training and understanding.
 6. Electronic messaging facility shall be provided on the operator station for any operator to enter a message to another operator.
- C. Site Specific Customizing Software:
1. Provide software which will allow the user to modify and tailor the temperature control to the specific and unique requirements of the equipment installed, the programs implemented, and to staffing and operational practices.
 2. Point alarms shall be user-classifiable as critical or non-critical. Critical alarms shall be displayed in a dialog box of the color monitor. Display shall include time and date of occurrence, indication of alarm condition, analog value or status, user address, and alarm message.
 3. A discrete per point detailed alarm-action taking message of up to 480 characters shall be available for each point.
 4. Alarms shall be directed to the user selected alarm printer.
 5. Non-critical alarms shall only output to the printer and OS disk in order of occurrence.
 6. Run time limit messages shall be presented and processed as alarm messages except the action message shall be of a maintenance directive nature.
- D. Dynamic trends shall provide for each OS of up to eight user selected points to show real time activity of the associated points. This information shall be printed and/or displayed in numeric, bar chart, curve plot, pie chart, and other formats, as selected by the operator.
- E. Standard Reports Shall Be Provided Which Shall Be Output onto the Selected Report Printer. The Following Standard Pre-formatted Reports Shall Be Provided:
1. The user shall be provided with a command trace feature selectable on a per point basis allowing the archiving of commands issued to each point.
 2. A custom report capability shall be provided to allow the user to format reports of any mix of text, points with status/value and descriptors, and points with status/value only.
 3. Alarm history. The last 4000 alarm events shall be disk archived. Viewing or printing shall be by entering a date range (from-to).
 4. Operator activity. Operator activity shall be archived. Viewing or printing shall be by entering a desired date range.
 5. Trend reports shall allow the operator to randomly select point archival. Equipment controllers trend points (hardware and software) shall be assignable to PC archive files for display at user selectable intervals of 10 seconds to 24 hours.

- F. Equipment controllers shall be up-line or down-line loadable to or from the OS disk for backup archival.
- G. Provide software to execute and observe diagnostics of any remote device connected to the peer bus and the ability to deactivate and restart the device.
- H. In addition, a word processing utility, graphics package, and spreadsheet shall be available for generic use. The base system software shall include a CRT "windowing" feature to allow the operator to monitor the real time system and use third party software simultaneously.

2.6 GRAPHIC PROGRAMMING

- A. Graphic Programming. Provide hardware and software required for complete equipment controllers ATC programming of plant programs including plant system schematic development, I/O hardware point definition, hardware and software text point descriptors, ATC algorithmic development, a controller software loading utility, and a live programming test facility. At a minimum, the following shall be provided in the graphics package:
 1. Boilers - control and status.
 2. Heating water pump - control and status.
 3. Floor plans showing temperature sensors - control and status.
 4. Air handling units, rooftop HVAC units and associated pumps, fans, dampers - control and status.
- B. Provide a Boolean logic switching table matrix module for building ON-OFF commands from combinations of and or functions.
- C. Provide a program testing utility which allows live and dynamic monitoring of the graphically displayed control programs provided.
- D. In addition to training specified elsewhere in this Specification, provide 4 days of additional programming training, at a minimum of 4 hours training per day. These 4 days of additional training shall be provided during the 1 year warranty period. They are intended for use by the Owner as questions regarding system operation arise. Coordinate with the Owner.
- E. Provide 2 sets of programmer's manuals.

2.7 CONTROLLER SOFTWARE

- A. Energy Management application programs and associated data files shall be in non-volatile memory.
 1. Optimum Start shall delay equipment start-up based on global outdoor temperature, space temperature, and system response to assure that comfort conditions are reached at scheduled occupancy. The optimum start program shall operate fully stand-alone in the local equipment controllers.
 2. A load reset program shall be provided to assure that only the minimum amount of heating, cooling, and electrical energy is supplied to satisfy zone temperature requirements.
- B. Control Software:
 1. Each equipment controllers shall contain up to 20 unique user modifiable time programs.
 2. Control Application Software shall be customized strictly to meet the detailed

requirements of the "Sequence of Operation" specified hereinafter. Equipment controllers and terminal controllers shall be fully programmable. Initial software shall be fully modifiable, and not restricted by vendor's specific configuration guidelines. Equipment controllers control software shall be designed via a graphic programming facility, the detailed graphic design of which shall be provided as system documentation. Control strategies shall be advanced as noted with stabilizing setpoint ramps and procedures to assure slow loading of variable load equipment and economizer modes to prevent unsafe overshoot of controlled pressure and unsafe undershoot of mixed air temperatures during start-up and transition periods.

C. Management Software:

1. Each equipment controllers shall be provided with a trend archive of at least the last 200 events (digital transitions or analog value changes) of any user selected group of up to 20 points. A stored event shall include date and time, and value or status. Point events shall be displayable at local panels as trend logs for evaluation of control system performance.
2. Each equipment controllers shall monitor analog input points and specified digital points for off-normal conditions. Each alarm shall have an "alarm delay" attribute which shall determine how long (in seconds) a point must be in an off-normal state prior to being considered in an alarm state.

- D. Communications Software: Each equipment controllers shall have a full master peer-to-peer communications module to support global data sharing, hierarchical control, and global control strategies specified.

2.8 DATA COMMUNICATIONS

- A. Equipment controllers shall be interconnected via a primary communications network. Terminal controllers shall also be connected together via secondary networks to provide data concentration and parallel processing. Networks shall support sensor sharing, global application programs, and bus-to-bus communications without the presence of a host PC.
- B. The equipment controller's communications network shall support true peer protocol such that loss of any single device will not cause total bus failure.

2.9 GENERAL

- A. ATC setpoints, reset schedules, time programs, historical trends shall be displayable at local ATC panels and on the system's operator workstations.
- B. I/O Interface: Hardwired inputs and outputs may tie into system through controllers. Protect points so that shorting will cause no damage to controllers.
1. Binary Inputs: Allow monitoring of on-off signals without external power.
 2. Pulse Accumulation Inputs: Accept up to 10 pulses per second.
 3. Analog Inputs: Allow monitoring of low-voltage (0- to 10-V dc), current (4 to 20 mA), or resistance signals.
 4. Binary Outputs: Provide on-off or pulsed low-voltage signal, selectable for normally open or normally closed operation.
 5. Analog Outputs: Provide modulating signal, either low voltage (0- to 10-V dc) or current (4 to 20 mA).
 6. Tri-State Outputs: Provide two coordinated binary outputs for control of 3-point, floating-type electronic actuators.

7. Universal I/Os: Provide software selectable binary or analog outputs.
- C. Power Supplies: Transformers with Class 2 current-limiting type or overcurrent protection; limit connected loads to 80 percent of rated capacity. DC power supply shall match output current and voltage requirements and be full-wave rectifier type with the following:
1. Output ripple of 5.0 mV maximum peak to peak.
 2. Combined 1 percent line and load regulation with 100-microsecond response time for 50 percent load changes.
 3. Built-in overvoltage and overcurrent protection and be able to withstand 150 percent overload for at least 3 seconds without failure.
- D. Power Line Filtering: Internal or external transient voltage and surge suppression for workstations or controllers with the following:
1. Minimum dielectric strength of 1000 V.
 2. Maximum response time of 10 nanoseconds.
 3. Minimum transverse-mode noise attenuation of 65 dB.
 4. Minimum common-mode noise attenuation of 150 dB at 40 to 100 Hz.

2.10 SPARE POINTS

- A. Provide a minimum of 10 percent spare points or 16 spare points, whichever is greater, in each ATC control panel for future use. Spare points shall be equally distributed among analog input, analog output, digital input and digital output. It is not intended that spare points be provided in unitary control panels which serve VAV boxes, unit ventilators, fan coil units and heat pumps. It is intended that spare points be provided in master control panels and in panels which serve boiler/mechanical rooms and major equipment such as air handling units.

2.11 ELECTRONIC SENSORS

- A. Description: Vibration and corrosion resistant; for wall, immersion, or duct mounting as required.
- B. Thermistor Temperature Sensors and Transmitters:
1. Accuracy: Plus or minus 0.5°F (0.3°C) at calibration point.
 2. Wire: Twisted, shielded-pair cable.
 3. Insertion Elements in Ducts: Single point, 8 inches (200 mm) long; use where not affected by temperature stratification or where ducts are smaller than 9 sq. ft. (0.84 sq. m).
 4. Averaging Elements in Ducts: 36 inches (915 mm) long, flexible; use where prone to temperature stratification or where ducts are larger than 10 sq. ft. (1 sq. m).
 5. Insertion Elements for Liquids: Brass or stainless-steel socket with minimum insertion length of 2-1/2 inches (64-mm).
 6. Room Sensor Cover Construction: See below.
 7. Outside-Air Sensors: Watertight inlet fitting, shielded from direct sunlight.
 8. Room Security Sensors: Stainless-steel cover plate with insulated back and security screws.
- C. Humidity Sensors: Bulk polymer sensing element.
1. Accuracy: 2 percent full range with linear output.
 2. Room Sensor Range: 20 to 80 percent relative humidity.
 3. Room Sensor Cover Construction: See below.

- D. Pressure Transmitters/Transducers:
 - 1. Static-Pressure Transmitter: Nondirectional sensor with suitable range for expected input, and temperature compensated.
 - a. Accuracy: 2 percent of full scale with repeatability of 0.5 percent.
 - b. Output: 4 to 20 mA.
 - c. Duct Static-Pressure Range: 0- to 5-inch wg (0 to 1240-Pa).
 - 2. Differential-Pressure Switch (Air or Water): Snap acting, with pilot-duty rating and with suitable scale range and differential.

2.12 THERMOSTATS AND TEMPERATURE SENSORS

- A. Thermostats and Sensors in locations in regular view by the occupants shall have covers which are simple, aesthetically pleasing, neutral in color, with manufacturer's logo, if any, in black or neutral color, and shall fit flush to the surrounding wall surface.
- B. Freezestats:
 - 1. Freezestat safety low limits shall be duct-mounted manual-reset and automatic-reset (see control sequences) 20-foot limited fill capillary-tube type, responsive to the coolest section of its length.
 - 2. Air handling systems which handle outside air (or a mix of outside air and return air) or are located outdoors shall have freezestats at hydronic coils. Where freezestats are required, provide both a manual-reset type set near freezing temperature for shutdown, and an automatic-reset type set at a warmer temperature for preventive action.
- C. Thermostats
 - 1. Electric thermostats shall be line voltage or low voltage type, suitable for the application. They shall have concealed setpoint adjustment and setpoint indicator. Electric thermostats shall be provided with manual adjustment dials and shall be protected by lockable tamper proof covers.
 - 2. Unit heater aquastats shall be strap-on type.
- D. Temperature Sensors:
 - 1. Temperature sensors shall provide a 2-wire connection to the controller that is polarity and wire type insensitive. Sensors shall have communications jacks for connection to the communication trunk to which the controller is connected. The temperature sensor, the connected controller, and other devices on the communications bus shall be accessible by the Graphical Programming tool.
 - 2. Provide with override buttons which, when depressed during unoccupied time periods, will override the zone's temperature controls and setpoints to occupied conditions for a user adjustable period of time (initially set for 2 hours).
- E. Tamper-Resistant Covers and Guards:
 - 1. Provide protective lockable guards for thermostats and temperature sensors located in high traffic and unsecure areas. These areas shall include, but not be limited to:
 - a. Cafeteria.
 - b. Locker Rooms.
 - c. Public Toilet Rooms.
 - d. Stairways.
 - e. Storage Areas.
 - f. Technology Lab.
 - g. Vestibules.

- h. Weight Room.
- 2. Provide tamper-resistant semi-blank covers (without manual adjustments or temperature indicators, but including override buttons) for thermostats and temperature sensors located in the following areas:
 - a. Lobbies.
 - b. Teachers' Lounge.
 - c. Corridors.

2.13 STATUS SENSORS

- A. Where differential pressure "sensor" is indicated or specified, they shall be analog-output type as specified herein. Where differential pressure "switch" is indicated, it may be digital-output type.
- B. Status Inputs for Fans: Unless otherwise specified: Differential-pressure switch with pilot-duty rating and with adjustable range of 0- to 5-inch wg (0 to 1240 Pa).
- C. Status Inputs for Pumps: Unless otherwise specified: Differential-pressure switch with pilot-duty rating and with adjustable pressure-differential range of 8 to 60 psig (55 to 414 kPa), piped across pump. Status Inputs for Electric Motors: Comply with ISA 50.00.01, current-sensing fixed- or split-core transformers with self-powered transmitter, adjustable and suitable for 175 percent of rated motor current.
- D. Voltage Transmitter (100- to 600-V ac): Comply with ISA 50.00.01, single-loop, self-powered transmitter, adjustable, with suitable range and 1 percent full-scale accuracy.
- E. Current Switches: Self-powered, solid-state with adjustable trip current, selected to match current and system output requirements.
- F. Electronic Valve/Damper Position Indicator: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.
- G. Water-Flow Switches: Bellows-actuated mercury or snap-acting type with pilot-duty rating, stainless-steel or bronze paddle, with appropriate range and differential adjustment, in NEMA 250, Type 1 enclosure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that power supply and data outlet is available to control units and operator workstation.

3.2 ELECTRICAL WIRING AND CONNECTION INSTALLATION

- A. Wiring and conduits shall be properly supported and run in a neat and workmanlike manner. Wiring and conduits exposed and in equipment rooms shall run parallel to or at right angles to the building structure. Wiring and conduits within enclosures shall be neatly bundled and anchored to prevent obstruction to devices and terminals. Wiring, conduits, wall boxes, and accessories shall conform to Division 26 – Electrical, and Division 27 of the Contract Documents.

- B. The ATC Contractor shall be responsible for electrical installation, including any low voltage and line voltage wiring which is required for a fully functional control system and not indicated on the Electrical Drawings or required by the Electrical Specifications (Divisions 26 and 27).
- C. Wiring shall be in accordance with local and national Codes and regulations.
- D. Provide electrical materials and installation under this Section. Requirements and standards shall be as specified in other Sections and Divisions of the Specifications, as indicated in paragraphs below.
 - 1. Install raceways, boxes, and cabinets in conformance to Division 26.
 - 2. Install building wire and cable in conformance to Division 26.
 - 3. Provide interface wiring (line and low voltage) as required to complete ATC system installation.
 - 4. Install signal and communication cable according to Division 26.
 - a. Conceal cable, except in mechanical rooms and areas where other conduit and piping are exposed.
 - b. Install exposed cable in raceway.
 - c. Plenum rated cable w/ J-hook supports are acceptable for installation above readily accessible spaces such as acoustical ceilings and inside existing walls.
 - d. Bundle and harness multi-conductor instrument cable in place of single cables where several cables follow a common path.
 - e. Fasten flexible conductors, bridging cabinets and doors, along hinge side; protect against abrasion. Tie and support conductors.
 - f. Number-code or color-code conductors for future identification and service of control system, except local individual room control cables.
 - g. Install wire and cable with sufficient slack and flexible connections to allow for vibration of piping and equipment.
- E. Control wiring in boiler room, mechanical rooms, and equipment rooms shall be installed in conduit which shall comply with the requirements of the Electrical Specifications.
- F. Electronic low-voltage wiring shall be #18 AWG minimum THHN and shielded if required.
- G. Provide power for normally-open duct reheat coils, fintube, and baseboard hot water valves from a central source(s). Interlock with hot water pump(s) to de-energize valves when hot water pumps are de-energized.
 - 1. Power for any temperature control panels required in addition to those indicated on the Drawings shall be the responsibility of this Section. Remaining equipment which is not powered by stand-by circuits shall default to their fail-safe positions.

3.3 INSTALLATION

- A. Verify location of room temperature sensors and other exposed control sensors with Drawings and room details before installation.
 - 1. Thermostats and temperature sensors are indicated on the Drawings for general location. Terminal heat transfer units and fans which control space temperature shall be provided with thermostatic control, whether or not a thermostat or temperature sensor has been indicated on the Drawings.
 - 2. Locate to avoid heat-generating equipment such as computers, copiers, cooking equipment, coffee makers, vending machines, and refrigerators. Where electrical outlets are indicated near sensors, verify whether equipment is intended.

3. Locate to avoid heating piping which may be concealed in partitions.
 4. Locate away from windows and exterior doors.
 5. Locate to avoid other false sources of heat such as strong sunlight.
- B. Provide guards on room sensors and thermostats in the following locations:
 1. Public areas other than classrooms and offices, including but not limited to: Corridors, hallways, entrances, lobbies, vestibules, stairwells, toilet rooms, locker rooms, storage rooms, cafeterias, and gymnasiums.
 2. Locations vulnerable to traffic.
 3. Where indicated.
 - C. Connect lead-lag controls to lock out the failed or non-selected motor, to prevent simultaneous operation.
 - D. Connect lead-lag controls so that only 1 motor can run in starter “hand” position.
 - E. Connect fire alarm shutdown of motors on the load side of controls and hand-off-auto switches, to prevent motor from running in any switch position during fire alarm.
 - F. For components to be installed under other Sections of the Specifications, provide delivery of components to appropriate Subcontractors, provide installation instructions, and supervise their installation.
 - G. Provide labels and nameplates to identify control components according to Division 23 Section "Identification for HVAC Piping and Equipment."
 - H. Install electronic and fiber-optic cables according to Division 27.
 - I. Enter computer programs and data files into the related computers including control programs, initial approved parameters and settings, and English descriptors.
 - J. Maintain CD copies of data file and application software for reload use in the event of a system crash or memory failure. 1 copy shall be delivered to the Owner during training session, and 1 copy shall be archived in the ATC Contractor's local software vault.
 - K. Install software in control units and operator workstation(s). Implement features of programs to specified requirements and as appropriate to sequence of operation.
 - L. Connect and configure equipment and software to achieve sequence of operation specified.

3.4 FIELD QUALITY CONTROL

- A. Coordinate with the requirements of Division 01 Section “General Commissioning Requirements”.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- C. Perform the following field tests and inspections and prepare test reports:
 1. Operational Test: After electrical circuitry has been energized, start units to confirm

- proper unit operation. Remove and replace malfunctioning units and retest.
2. Test and adjust controls and safeties.

D. DDC Verification:

1. Verify that instruments are installed before calibration, testing, and loop or leak checks.
2. Check instruments for proper location and accessibility.
3. Check instrument installation for direction of flow, elevation, orientation, insertion depth, and other applicable considerations.
4. Check flow instruments. Inspect tag number and line and bore size, and verify that inlet side is identified and that meters are installed correctly.
5. Check pressure instruments, piping slope, installation of valve manifold, and self-contained pressure regulators.
6. Check temperature instruments and material and length of sensing elements.
7. Check control valves. Verify that they are in correct direction.
8. Check DDC system as follows:
 - a. Verify that DDC controller power supply is from emergency power supply, if applicable.
 - b. Verify that wires at control panels are tagged with their service designation and approved tagging system.
 - c. Verify that spare I/O capacity has been provided.
 - d. Verify that DDC controllers are protected from power supply surges.

- E. Replace damaged or malfunctioning controls and equipment and repeat testing procedures.

3.5 ADJUSTING

A. Calibrating and Adjusting:

1. Calibrate instruments.
2. Make 3-point calibration test for both linearity and accuracy for each analog instrument.
3. Calibrate equipment and procedures using manufacturer's written recommendations and instruction manuals. Use test equipment with accuracy at least double that of instrument being calibrated.
4. Control System Inputs and Outputs:
 - a. Check analog inputs at 0, 50, and 100 percent of span.
 - b. Check analog outputs using milliamper meter at 0, 50, and 100 percent output.
 - c. Check digital inputs using jumper wire.
 - d. Check digital outputs using ohmmeter to test for contact making or breaking.
 - e. Check resistance temperature inputs at 0, 50, and 100 percent of span using a precision-resistant source.
5. Flow:
 - a. Set differential pressure flow transmitters for 0 and 100 percent values with 3-point calibration accomplished at 50, 90, and 100 percent of span.
 - b. Manually operate flow switches to verify that they make or break contact.
6. Pressure:
 - a. Calibrate pressure transmitters at 0, 50, and 100 percent of span.
 - b. Calibrate pressure switches to make or break contacts, with adjustable differential set at minimum.
7. Temperature:
 - a. Calibrate resistance temperature transmitters at 0, 50, and 100 percent of span using a precision-resistance source.
 - b. Calibrate temperature switches to make or break contacts.

8. Stroke and adjust control valves and dampers without positioners, following the manufacturer's recommended procedure, so that valve or damper is 100 percent open and closed.
 9. Stroke and adjust control valves and dampers with positioners, following manufacturer's recommended procedure, so that valve and damper is 0, 50, and 100 percent closed.
 10. Provide diagnostic and test instruments for calibration and adjustment of system.
 11. Provide written description of procedures and equipment for calibrating each type of instrument. Submit procedures review and approval before initiating startup procedures.
- B. Adjust initial temperature set points.
- C. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to 3 visits to Project during other than normal occupancy hours for this purpose.

3.6 VALIDATION

- A. The ATC Contractor shall completely check out, calibrate, and test connected hardware and software to insure that the system performs in accordance with the approved submittals for specifications and sequences of operations.
- B. Witnessed Validation Demonstration: Shall consist of:
1. Display and demonstrate each type of data entry to show site specific customizing capability.
 2. Execute digital and analog commands.
 3. Demonstrate ATC loop precision and stability via trend logs of inputs and outputs.
 4. Demonstrate energy management performance via trend logs and command trace.
 5. Demonstrate that each control point, tag, or address is associated with the proper device, such as a room sensor input or an actuator output. This demonstration shall include visual confirmation that the measured values and the output actions match what is indicated in the control system.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain Mechanical instrumentation and controls. Refer to Division 01 Section "Demonstration and Training."

3.8 TRAINING

- A. Training shall be by the ATC Subcontractor and shall utilize specified manuals and as-built documentation.
- B. Operator training shall include 1 four-hour sessions encompassing:
1. Sequence of Operation review.
 2. Selection of displays and reports.
 3. Use of the specified functions.
 4. Setting and adjusting of occupancy schedules.
 5. Troubleshooting of sensors.
 6. Owner questions/concerns.

PART 4 - SEQUENCE OF OPERATION

4.1 GENERAL

- A. Setpoints shall be adjustable by the building operator through the graphic interface on the operator's workstation desktop PC, and through a portable laptop computer plugged into the system at locations throughout the building.
- B. Provide the ability for the Commissioning Agent and the Testing and Balancing Agent to connect to the system and change setpoints, to temporarily override setpoints, and to override modes of operation, as may be required for their work.

4.2 ALARMS

- A. In addition to alarms specified in the following sequences, provide alarms as follows. Program alarms selected by the Owner to initiate a signal to the Owner's off-site building security company, and to designated agents such as company employees.
 - 1. Room low temperature alarm.
 - 2. Room high temperature alarm.
 - 3. Boiler failure alarm.
 - 4. Pump failure alarm (both pumps in lead-lag situations).

4.3 OCCUPIED/UNOCCUPIED MODE

- A. Replace only as needed to ensure compatibility and full function with new DDC controllers.

4.4 HEATING/COOLING MODE

- A. Heating Mode:
 - 1. Heating mode is automatically enabled when outside air temperature drops below setpoint (60°F, adjustable), or when there is a call for heating from any 2 (quantity adjustable) zones or more, or from the low-temperature alarm in any space. Heating mode is automatically disabled when the outside air temperature rises above setpoint.
 - 2. Heating control valves are powered from dedicated circuits. When the hot water pumps are disabled, control power to the valves is de-energized, allowing the valves to go to failsafe position. This is to prolong actuator life by turning them off in warm weather.
- B. Cooling Mode:
 - 1. Cooling mode is automatically enabled when outside air temperature rises above setpoint (10°F, adjustable). Cooling mode is automatically disabled when the outside air temperature drops below setpoint.
 - 2. Cooling mode is enabled by the DDC system when there is a call for mechanical cooling. Economizer cooling is the first stage of cooling. For systems which have economizer cooling, mechanical cooling is locked out when outside air temperature is below 45°F (adjustable).
- C. Deadband (Zero-Energy Mode): In spaces and systems with both heating and cooling setpoints, there shall be a difference of at least 4°F between temperature setpoints, unless otherwise specified. When the sensed temperature or humidity is between the heating and cooling setpoints, the system shall operate with no heating hot water or cooling except as required to maintain the status quo.

- D. Provide manual override points on the graphics screen to allow the Owner to override the automatic heating and cooling modes.

4.5 AIR HANDLING UNITS (AHUs, HVs, and AAVs)

- A. Each unit is DDC controlled using electric actuation.
- B. Existing controls sequence to remain, update existing controllers to interface with new control system.
- C. Provide new graphics display for all control points directly associated with air handling unit.

4.6 BASEBOARD AND FINTUBE RADIATION (STAND-ALONE)

- A. Space Sensor: Wall-mounted, with setpoint selector and occupied/unoccupied override button.
- B. Existing controls sequence to remain, update existing controllers to interface with new control system.
- C. Provide new graphics display for control points associated with baseboard and fin tube radiation.

4.7 CABINET UNIT HEATERS (CUH)

- A. Space sensor: Wall-mounted, except where sensor is indicated on the Drawings to be mounted in unit return air. Blank cover, without setpoint dial or thermometer.
- B. Existing controls sequence to remain, update existing controllers to interface with new control system.
- C. Provide new graphics display for control points associated with cabinet unit heater.

4.8 EXISTING DUCTLESS SPLIT SYSTEMS AND MINI-SPLIT SYSTEMS

- A. Space Sensor: Wall-mounted, with setpoint selector and occupied/unoccupied override button.
- B. Existing controls sequence to remain, integrate existing controllers to interface with new control system.

4.9 DUCT-MOUNTED REHEAT COILS

- A. Space Sensor: Wall-mounted, with setpoint selector and occupied/unoccupied override button.
- B. Existing controls sequence to remain, update existing controllers to interface with new control system.
- C. Provide new graphics display for control points associated with reheat coils.

4.10

4.10 DUCT MOUNTED REHEAT COILS AND BASEBOARD/FINTUBE RADIATION

- A. Space Sensor: Wall-mounted, with setpoint selector and occupied/unoccupied override button.

- B. Existing controls sequence to remain, update existing controllers to interface with new control system.
- C. Provide new graphics display for control points associated with reheat coils, baseboard, and fin tube radiation. .

4.11 HEATING SUPPLY WATER TEMPERATURE CONTROL

- A. Gas-fired hot water boilers are operated independently of any other system controls.
 - 1. Existing controls sequence to remain, update existing controllers to interface with new control system.
 - 2. Provide new graphics display for control points associated with Heating Supply Water Temperature Control system.
 - 3. The ATC monitors boiler safeties including low water cutoff and flame failure.

4.12 HOT WATER CIRCULATING PUMPS

- A. Pumps are started and stopped through the DDC system. The lead pump runs continuously in heating mode.
 - 1. Existing controls sequence to remain, update existing controllers to interface with new control system.
 - 2. Provide new graphics display for control points associated with Hot Water Circulating Pumps

4.13 FIRE ALARM SYSTEM SHUT-DOWN INTERFACE

- A. Existing controls sequence to remain.

END OF SECTION 230900

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