

Campbell Barn Electrical Upgrades

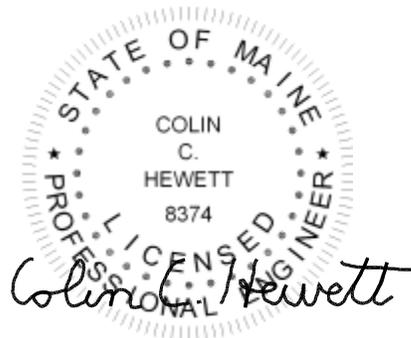
158 Hospital Street
Augusta, ME 04330

Owner:
State of Maine
Bureau of General Services
77 State House Station
Augusta, ME 04333

Prepared by

Hewett & Whitney Engineers
161 Main Street, Suite 2A – PO Box 318
Winthrop, ME 04364

May 26, 2015



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00 11 13
Notice to Contractors

Campbell Barn Electrical Upgrades

Lighting, lighting controls, emergency and exit lighting and fire alarm system.

The cost of the work is approximately \$ 125,000. The work to be performed under this contract shall be completed on or before *August 25, 2015*.

1. Sealed Contractor bids for the project noted above, in envelopes plainly marked "Bid for *Campbell Barn Electrical Upgrades*" and addressed to:
Peter Glasow
Bureau of General Services
4th Floor, Cross State Office Building, 111 Sewall Street
77 State House Station
Augusta, Maine 04333-0077
will be opened and read aloud at *the address shown above* at **2:00 p.m.** on **Tuesday June 16, 2015**. Bids submitted after the noted time will not be considered and will be returned unopened.
2. The bid shall be submitted on the Contractor Bid Form (section 00 41 13) provided in the Bid Documents. The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.
3. Bid security *is required* on this project.
The Bidder shall include a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with the completed bid form submitted to the Owner.
4. Performance and Payment Bonds *are required* on this project.
The selected Contractor shall furnish a 100% contract Performance Bond (section 00 61 13.13) and a 100% contract Payment Bond (section 00 61 13.16) in the contract amount to cover the execution of the Work.
5. Filed Sub-bids *are not required* on this project.
6. There *are no* Pre-qualified General Contractors on this project.

00 11 13
Notice to Contractors

7. An on-site pre-bid conference *will* be conducted for this project. The pre-bid conference is *mandatory* for Prime Electrical Contractors and optional for and suppliers. Contractors who arrive late or leave the meeting early may be prohibited from participating in this meeting and bidding. *1:00 PM Tuesday June 9, 2015 at the site.*

8. Bid Documents - full sets only - will be available on or about *May 26, 2015* and may be obtained *at no cost* from the BGS website Maine.gov/bgs

00 21 13
Instructions to Bidders

1. Bidder Requirements

- 1.1 A bidder is a Contractor who is qualified, or has been specifically pre-qualified by the Bureau of General Services, to bid on the proposed project described in the Bid Documents.
- 1.2 Contractors and Subcontractors bidding on projects that utilize Filed Sub-bids shall follow the requirements outlined in these Bid Documents for such projects. See Section 00 22 13 for additional information.
- 1.3 Contractors are not eligible to bid on the project when their access to project design documents prior to the bid period distribution of documents creates an unfair bidding advantage. Prohibited access includes consultation with the Owner or with design professionals engaged by the Owner regarding cost estimating, constructability review, or project scheduling. This prohibition to bid applies to open, competitive bidding or pre-qualified contractor bidding or Filed Sub-bidding. The Bureau may require additional information to determine if the activities of a Contractor constitute an unfair bidding advantage.
- 1.4 Each bidder is responsible for becoming thoroughly familiar with the Bid Documents prior to submitting a bid. The failure of a bidder to review evident site conditions, to attend available pre-bid conferences, or to receive, examine, or act on addenda to the Bid Documents shall not relieve that bidder from any obligation with respect to their bid or the execution of the work as a Contractor.
- 1.5 Prior to the award of the contract, General Contractor bidders or Filed Sub-bidders may be required to provide documented evidence to the Owner or the Bureau showing compliance with the provisions of this section, their business experience, financial capability, or performance on previous projects.
- 1.6 The selected General Contractor bidder will be required to provide proof of insurance before a contract can be executed.
- 1.7 Contracts developed from this bid shall not be assigned, sublet or transferred without the written consent of the Owner.

2. Authority of Owner

- 2.1 The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.
- 2.2 Subject to the Owner's stated right to accept or reject any or all bids, the Contractor shall be selected on the basis of the sum of the lowest acceptable bid plus any Alternate Bids the Owner elects to include.
- 2.3 The Owner is exempt from the payment of Federal Excise Taxes and Federal Transportation Tax on all shipments, as well as Maine State Sales and Use Taxes on items "...physically incorporated in real property ...". The bidder shall not include these taxes in their bid. See Section 00 72 13 for additional information.

00 21 13
Instructions to Bidders

3. Submitting Bids and Bid Requirements

- 3.1 Each bid shall be submitted on the forms provided in the Bid Documents.
- 3.2 Each bid shall be valid for a period of thirty calendar days following the Project bid opening date and time.
- 3.3 A bid that contains an escalation clause is considered invalid.
- 3.4 Bidders shall include a Bid Bond or other approved bid security with the bid form submitted to the Owner when the bid form indicates such bid security is required. The bond value shall be 5% of the bid amount. The form of bond is shown in section 00 43 13.
- 3.5 Bidders shall include the cost of Performance and Payment Bonds in the bid amount if the bid amount will result in a construction contract value over \$125,000, inclusive of alternate bids that may be awarded in the contract. Pursuant to 14 M.R.S.A., Section 871, Public Works Contractors' Surety Bond Law of 1971, subsection 3, the selected Contractor is required to provide these bonds before a contract can be executed. The form of bonds are shown in section 00 61 13.13 and 00 61 13.16.
- 3.6 Bidders may modify bids in writing prior to the bid closing time. Such written amendments shall not disclose the amount of the initial bid. If so disclosed, the entire bid is considered invalid.
- 3.7 Bidders shall acknowledge on the bid form all Addenda issued in a timely manner. The Architect shall not issue Addenda affecting bidders less than 72 hours prior to the bid closing time. Addenda shall be issued to all companies who are registered holders of Bid Documents.
- 3.8 A bid may be withdrawn without penalty if a written request by the bidder is presented to the Owner prior to the bid closing time. Such written withdrawal requests are subject to verification as required by the Bureau. After the bid closing time, such written withdrawal requests may be allowed in consideration of the bid bond or, without utilizing a bid bond, if the Contractor provides documented evidence to the satisfaction of the Bureau that factual errors had been made on the bid form.
- 3.9 Projects which require a State of Maine wage determination will include that schedule as part of the Bid Documents. See section 00 73 46, if such rates are required.
- 3.10 Projects which require compliance with the Davis-Bacon Act are subject to the regulations contained the Code for Federal Regulations and the federal wage determination which is made a part of the Bid Documents. See section 00 73 46, if such rates are required.

**00 41 13
Contractor Bid Form**

Campbell Barn Electrical Upgrades

To: *Peter Glasow*
Bureau of General Services
4th Floor Cross Office Building
111 Sewall St
77 State House Station
Augusta, Maine 04333-0077

The undersigned, or "Bidder", having carefully examined the form of contract, general conditions, specifications and drawings dated *May 2015*, prepared by *Hewett & Whitney Engineers* for *Campbell Barn Electrical Upgrades*, as well as the premises and conditions relating to the work, proposes to furnish all labor, equipment and materials necessary for and reasonably incidental to the construction and completion of this project for the Base Bid amount of:

_____ Dollars

\$ _____

Allowances *are not included* on this project.

1. Alternate bids *are not included* on this project.

2. The Bidder acknowledges receipt of the following addenda to the specifications and drawings:

Addendum No. _____ Dated: _____

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

4. Filed Sub-bids *are not required* on this project.
The bid amount includes the following Filed Sub-bids which were submitted to the Bidder and to the Maine Construction Bid Depository.

**00 41 13
Contractor Bid Form**

Campbell Barn Electrical Upgrades

5. The Bidder agrees, if this bid is accepted by the Owner, to sign the designated Owner-Contractor contract and deliver it, with any and all bonds and affidavits of insurance specified in the Bid Documents, within twelve calendar days after the date of notification of such acceptance, except if the twelfth day falls on a State of Maine government holiday or other closure day, a Saturday, or a Sunday, in which case the aforementioned documents must be received before 12:00 noon on the day following the holiday or other closure day, Saturday or Sunday.

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

6. This bid is hereby submitted by:

Signature: _____

Printed name and title: _____

Company name: _____

Mailing address: _____

City, state, zip code: _____

Phone number: _____

Email address: _____

State of incorporation,
if a corporation: _____

List of all partners,
if a partnership: _____

STATE OF MAINE
Bureau of General Services
CONSTRUCTION CONTRACT

THIS AGREEMENT made the date day of month in the year 2013 by and between the State of Maine through the Property Management Division hereinafter called the *Owner* and Contractor company name hereinafter called the *Contractor*.

BGS Project No.: 167
Other Project No.: 15010

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: Campbell Barn Electrical Upgrades.

§ 1.2 The specifications and the drawings have been prepared by Hewett & Whitney Engineers, 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 25, 2015. For each calendar day the project remains uncompleted \$TBD 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 \$125,000 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 30 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, instructions to bidders, bid form, 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: May 26, 2016

§ 7.3 Drawings: E0.1 through E2.1

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

ARTICLE 8 OTHER PROVISIONS

§ 8.1 The *Owner* and the *Contractor* are required to comply with applicable provisions of the American Recovery and Reinvestment Act (ARRA), and the Qualified School Construction Bonds (QSCB) program, including, but not limited to, the Buy American criteria, federal wage rates, and program-specific reporting requirements, for those projects funded through ARRA and QSCB.

00 61 13.13
Contractor Performance Bond

Bond No.: insert bond number

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

The condition of the above obligation is such that if the principal shall promptly and faithfully perform the contract entered into this insert day, i.e.: 8th day of select month, select year, which is the same date as that of the construction contract, for the construction of insert name of project as designated in the contract documents, then this obligation shall be null and void.

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

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

**00 61 13.13
Contractor Performance Bond**

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

Signed and sealed this *insert day, i.e.: 8th* day of *select month, select year*, which is the same date as that of the construction contract.

Contractor

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

Surety

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

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

00 61 13.16
Contractor Payment Bond

Bond No.: insert bond number

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

The condition of the above obligation is such that if the principal shall promptly satisfy all claims and demands incurred for all labor and materials, used or required by the principal in connection with the work described in the contract entered into this insert day, i.e.: 8th day of select month, select year, which is the same date as that of the construction contract, for the construction of insert name of project as designated in the contract documents, and shall fully reimburse the obligee for all outlay and expense with said obligee may incur in making good any default of said principal, then this obligation shall be null and void.

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

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

**00 61 13.16
Contractor Payment Bond**

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

Signed and sealed this *insert day, i.e.: 8th* day of *select month, select year*, which is the same date as that of the construction contract.

Contractor

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

Surety

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

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

00 71 00
Definitions

1. Definitions

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

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Definitions

purpose. The Certificate of Substantial Completion also include a provisional list of items (a "punch list") remaining to be corrected by the Contractor, if any, and identifies a date from which the project warranty period commences.

- 1.13 *Certificate of Occupancy*: A document developed by a local jurisdiction such as the Code Enforcement Officer that grants permission to the Owner to occupy a building.
- 1.14 *Change Order (CO)*: A document that modifies the contract and establishes the basis of a specific adjustment to the Contract Price or the Contract Time, or both. Change Orders may address correction of omissions, errors, and document discrepancies, or additional requirements. Change Orders should include all labor, materials and incidentals required to complete the work described. A Change Order is not valid until signed by the Contractor, Owner and Architect and approved by the Bureau.
- 1.15 *Change Order Proposal (COP)*: Change proposed by the Contractor in the contract amount, requirements, or time, which becomes a Change Order when approved by the Owner.
- 1.16 *Clerk of the Works*: The authorized representative of the Architect on the job site. Clerk of the Works is also called Architect's representative.
- 1.17 *Construction Change Directive (CCD)*: A written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to final agreement with the Contractor on adjustment, if any, in the Contract Price or Contract Time, or both.
- 1.18 *Contract*: A written agreement between the Owner and the successful bidder which obligates the Contractor to perform the work specified in the Contract Documents and obligates the Owner to compensate the Contractor at the mutually accepted sum, rates or prices.
- 1.19 *Contract Bonds (also known as Payment and Performance Bonds)*: The approved forms of security, furnished by the Contractor and their surety, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials and equipment by the Contractor.
- 1.20 *Contract Documents*: The drawings and written specifications (including all addenda), Standard General Conditions, and the contract (including all Change Orders subsequently incorporated in the documents).
- 1.21 *Contract Price*: The dollar amount of the construction contract, also called *Contract Sum*.
- 1.22 *Contract Time*: The designated duration of time to execute the Work of the contract, with a specific date for completion.
- 1.23 *Contractor*: Also called the "General Contractor" or "GC" the individual or entity undertaking the execution of the general contract work under the terms of the contract with the Owner, acting directly or through a duly authorized representative. The Contractor is responsible for the means, methods and materials utilized in the execution and completion of the Work.

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Definitions

- 1.24 *Drawings*: The graphic and pictorial portion of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.
- 1.25 *Filed Sub-bid*: The designated major Subcontractor's (or, in some cases, Contractor's) written offer of a specified dollar amount or amounts, submitted on a form included in the Bid Documents, for the performance of a particular portion of the Work. A Filed Sub-bid may include bonds or other requirements.
- 1.26 *Final Completion*: Project status indicating when the Work is fully completed in compliance with the Contract Documents. Final Completion is documented by a date on which the Contractor's obligations under the contract are complete and accepted by the Owner and final payment becomes due and payable.
- 1.27 *General Requirements*: The on-site overhead expense items the Contractor provides for the Project, typically including, but not limited to, building permits, construction supervision, Contract Bonds, insurance, field office, temporary utilities, rubbish removal, and site fencing. Overhead expenses of the Contractor's general operation are not included. Sometimes referred to as the Contractor's General Conditions.
- 1.28 *Owner*: The State agency which is represented by duly authorized individuals. The Owner is responsible for defining the scope of the Project and compensation to the Architect and Contractor.
- 1.29 *Owner's Representative*: The individual or entity contracted by the Owner to be an advisor and information conduit regarding the Project.
- 1.30 *Overhead*: General and administrative expenses of the Contractor's principal and branch offices, including payroll costs and other compensation of Contractor employees, deductibles paid on any insurance policy, charges against the Contractor for delinquent payments, and costs related to the correction of defective work, and the Contractor's capital expenses, including interest on capital used for the work.
- 1.31 *Performance and Payment Bonds (also known as Contract Bonds)*: The approved forms of security, furnished by the Contractor and their surety, which guarantee the faithful performance of all the terms of the contract and the payment of all bills for labor, materials and equipment by the Contractor.
- 1.32 *Post-Bid Addendum*: Document issued by the Architect that defines a potential Change Order prior to signing of the construction contract. The Post-Bid Addendum allows the Owner to negotiate contract changes with the Bidder submitting the lowest valid bid, only if the negotiated changes to the Bid Documents result in no change or no increase in the bid price.
- A Post-Bid Addendum may also be issued after a competitive construction Bid opening to those Bidders who submitted a Bid initially, for the purpose of rebidding the Project work without re-advertising.
- 1.33 *Project*: The construction project proposed by the Owner to be constructed according to the Contract Documents. The entire public improvement project may also include separate construction and other

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Definitions

activities conducted by the Owner or other contractors. The Owner shall inform all contractors of the scope of the entire public improvement project relative to each individual contract.

- 1.34 *Proposal*: The Contractor's written offer submitted to the Owner for consideration containing a specified dollar amount or rate, for a specific scope of work, and including a schedule impact, if any. A proposal shall include all costs for overhead and profit. After acceptance by all parties a proposal amends the contract and is implemented by the Contractor.
- 1.35 *Proposal Request (PR)*: An Owner's written request to the Contractor for a Change Order Proposal.
- 1.36 *Punch List*: A document that identifies the items of work remaining to be done by the Contractor at the Close Out of a Project. The Punch List is created as a result of a final inspection of the work only after the Contractor attests that all of the Work is in its complete and permanent status.
- 1.37 *Request For Information (RFI)*: A Contractor's written request to the Architect for clarification, definition or description of the Work. RFIs shall be presented by the Contractor in a timely manner to avoid any negative impact on the Schedule of Work.
- 1.38 *Request For Proposal (RFP)*: An Owner's written request to the Contractor for a Change Order Proposal.
- 1.39 *Requisition for Payment*: The document in which the Contractor certifies that the Work described is, to the best of the Contractor's knowledge, information and belief, complete and that all previous payments have been paid by the Contractor to Subcontractors and suppliers, and that the current requested payment is now due. See *Schedule of Values*.
- 1.40 *Retainage*: The amount, calculated at five percent (5%) of the contract value or a scheduled value, that the Owner shall withhold from the Contractor until the work or portion of work is declared substantially complete or otherwise accepted by the Owner. The Owner may, if requested, reduce the amount withheld if the Owner deems it desirable and prudent to do so. (See Title 5 M.R.S.A., Section 1746.)
- 1.41 *Sample*: A physical example provided by the Contractor which illustrates materials, equipment or workmanship and establishes standards by which the Work will be judged.
- 1.42 *Schedule of the Work*: The document prepared by the Contractor and approved by the Owner that specifies the dates on which the Contractor plans to begin and complete various parts of the Work, including dates on which information and approvals are required from the Owner.
- 1.43 *Schedule of Values*: The document prepared by the Contractor and approved by the Owner before the commencement of the Work that specifies the dollar values of discrete portions of the Work equal in sum to the contract amount. The Schedule of Values is used to document progress payments of the Work in regular (usually monthly) requisitions for payment. See *Requisition for Payment*.
- 1.44 *Shop Drawings*: The drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

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Definitions

- 1.45 *Specifications*: The portion of the Contract Documents consisting of the written requirements of the Work for materials, equipment, systems, standards, workmanship, and performance of related services.
- 1.46 *Subcontractor*: An individual or entity undertaking the execution of any part of the Work by virtue of a written agreement with the Contractor or any other Subcontractor. Also, an individual or entity retained by the Contractor or any other Subcontractor as an independent contractor to provide the labor, materials, equipment or services necessary to complete a specific portion of the Work.
- 1.47 *Substantial Completion*: Project status indicating when the Work or a designated portion of the Work is sufficiently complete in compliance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended purpose without unscheduled disruption. Substantial Completion is documented by the date of the Certificate of Substantial Completion signed by the Owner and the Contractor.
- 1.48 *Superintendent*: The representative of the Contractor on the job site, authorized by the Contractor to receive and fulfill instructions from the Architect.
- 1.49 *Surety*: The individual or entity that is legally bound with the Contractor and Subcontractor to insure the faithful performance of the contract and for the payment of the bills for labor, materials and equipment by the Contractor and Subcontractors.
- 1.50 *Work*: The construction and services, whether completed or partially completed, including all labor, materials, equipment and services provided or to be provided by the Contractor and Subcontractors to fulfill the requirements of the Project as described in the Contract Documents.

00 72 13
General Conditions

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32. Payments Withheld
33. Liens
34. Indemnification
35. Workmanship
36. Close-out of the Work
37. Date of Completion and Liquidated Damages
38. Dispute Resolution

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1. Preconstruction Conference

- 1.1 The Contractor shall, upon acceptance of a contract and prior to commencing work, schedule a preconstruction conference with the Owner and Architect. The purpose of this conference is to:
- a) introduce all parties who have a significant role in the Project, including:
 - Owner (State Agency)
 - Bureau of General Services (BGS)
 - Architect
 - Consultants
 - Clerk-of-the-works
 - Contractor (GC)
 - Superintendent
 - Subcontractors
 - Other State agencies
 - Owner's Representative
 - Construction testing company
 - Commissioning agent
 - Special Inspections agent;
 - b) review the responsibilities of each party;
 - c) review any previously-identified special provisions of the Project;
 - d) review the Schedule of the Work calendar submitted by the Contractor to be approved by the Owner and Architect;
 - e) review the Schedule of Values form submitted by the Contractor to be approved by the Owner and Architect;
 - f) establish routines for Shop Drawing approval, contract changes, requisitions, et cetera;
 - g) discuss jobsite issues;
 - h) discuss Project close-out procedures;
 - i) provide an opportunity for clarification of Contract Documents before work begins;
 - j) schedule regular meetings at appropriate intervals for the review of the progress of the Work.

2. Intent and Correlation of Contract Documents

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

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3. Additional Drawings and Specifications

- 3.1 The Owner shall provide to the Contractor, at no additional expense to the Contractor, a reasonable quantity of additional Drawings and Specifications for the execution of the Work.
- 3.2 The Architect shall promptly furnish additional revised Drawings and Specifications that are created due to corrections or clarifications made by the Architect. All such information shall be consistent with, and reasonably inferred from, the Contract Documents. The Contractor shall do no work without the proper Drawings and Specifications.

4. Record of Documents

- 4.1 The Contractor shall maintain one complete set of Contract Documents on the jobsite, in good order and current status, for access by the Owner and Architect.
- 4.2 The Contractor shall maintain, continuously updated, complete records of Requests for Information, Architectural Supplemental Instructions, Information Bulletins, supplemental sketches, Change Order Proposals, Change Orders, Shop Drawings, testing reports, et cetera, for access by the Owner and Architect.

5. Ownership of Contract Documents

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

6. Shop Drawings

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

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7. Samples

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

8. Substitutions

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

9. Patents and Royalties

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

10. Surveys, Layout of Work

- 10.1 The Owner shall furnish all property surveys unless otherwise specified.
- 10.2 The Contractor is responsible for correctly staking out the Work on the site. The Contractor shall employ a competent surveyor to position all construction on the site. The surveyor shall run the

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- axis lines, establish correct datum points and check each line and point on the site to insure their accuracy. All such lines and points shall be carefully preserved throughout the construction.
- 10.3 The Contractor shall lay out all work from dimensions given on the Drawings. The Contractor shall take measurements and verify dimensions of any existing work that affects the Work or to which the Work is to be fitted. The Contractor is solely responsible for the accuracy of all measurements. The Contractor shall verify all grades, lines, levels, elevations and dimensions shown on the Drawings and report any errors or inconsistencies to the Architect prior to commencing work.
11. Permits, Laws, and Regulations
- 11.1 The Owner is responsible for obtaining any zoning approvals or other similar local project approvals necessary to complete the Work, unless otherwise specified in the Contract Documents.
- 11.2 The Owner is responsible for obtaining Maine Department of Environmental Protection, Maine Department of Transportation, or other similar state government project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 11.3 The Owner is responsible for obtaining any federal agency project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 11.4 The Owner is responsible for obtaining all easements for permanent structures or permanent changes in existing facilities.
- 11.5 The Contractor is responsible for obtaining and paying for all permits and licenses necessary for the implementation of the Work. The Contractor shall notify the Owner of any delays, variance or restrictions that may result from the issuing of permits and licenses.
- 11.6 The Contractor shall comply with all ordinances, laws, rules and regulations and make all required notices bearing on the implementation of the Work. In the event the Contractor observes disagreement between the Drawings and Specifications and any ordinances, laws, rules and regulations, the Contractor shall promptly notify the Architect in writing. Any necessary changes shall be made as provided in the contract for changes in the work. The Contractor shall not perform any work knowing it to be contrary to such ordinances, laws, rules and regulations.
- 11.7 The Contractor shall comply with local, state and federal regulations regarding construction safety and all other aspects of the Work.
12. Taxes
- 12.1 The Owner is exempt from the payment of Federal Excise Taxes on articles not for resale and from the Federal Transportation Tax on all shipments, as well as Maine State Sales and Use Taxes. Pricing in all Change Order Proposals from the Contractor and Subcontractors shall not include these taxes.
- 12.2 Maine statute (36 M.R.S.A. §1760) allows "...an exemption from sales and use tax on items which will be physically incorporated in real property of an exempt organization. This exemption only applies to lumber, hardware, doors and windows, nails, insulation and other building materials actually affixed to realty. Tools, wearing apparel, consumable supplies, machinery and equipment used by the Contractor are taxable even if purchased specifically for the exempt job."
- 12.3 The Contractor may contact Maine Revenue Services, 24 State House Station, Augusta, Maine 04333 for guidance on tax exempt regulations authorized by 36 M.R.S.A. §1760 and detailed in Rule 302 (18-125 CMR 302).

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13. Labor and Wages

- 13.1 The Contractor shall conform to the labor laws of the State of Maine, and all other laws, ordinances, and legal requirements affecting the work in Maine.
- 13.2 The Architect shall include a wage determination document prepared by the Maine Department of Labor in the Contract Documents for state-funded contracts in excess of \$50,000. The document shows the minimum wages required to be paid to each category of labor employed on the project.
- 13.3 On projects requiring a Maine wage determination, the Contractor shall submit monthly payroll records to the Owner ("the contracting agency") showing the name and occupation of all workers and all independent contractors employed on the project. The monthly submission must also include the Contractor's company name, the title of the project, hours worked, hourly rate or other method of remuneration, and the actual wages or other compensation paid to each person.
- 13.4 The Contractor shall not reveal, in the payroll records submitted to the Owner, personal information regarding workers and independent contractors, other than the information described above. Such information shall not include Social Security number, employee identification number, or employee address or phone number, for example.
- 13.5 The Contractor shall conform to Maine statute by providing to the Owner a list of all subcontractors and independent contractors on the job site and a record of the entity to whom that subcontractor or independent contractor is directly contracted and by whom that subcontractor or independent contractor is insured for workers' compensation purposes.
- 13.6 The Contractor shall enforce strict discipline and good order among their employees at all times, and shall not employ any person unfit or unskilled to do the work assigned to them.
- 13.7 The Contractor shall promptly pay all employees when their compensation is due, shall promptly pay all others who have billed and are due for materials, supplies and services used in the Work, and shall promptly pay all others who have billed and are due for insurance, workers compensation coverage, federal and state unemployment compensation, and Social Security charges pertaining to this Project. Before final payments are made, the Contractor shall furnish to the Owner affidavits that all such payments described above have been made.
- 13.8 The Contractor may contact the Maine Department of Labor, 54 State House Station, Augusta, Maine 04333 for guidance on labor issues.

14. Insurance Requirements

- 14.1 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. The Contractor shall not allow any Subcontractor to commence work on a subcontract until all similar insurance required of the Subcontractor has been so obtained and approved.
- 14.2 The Owner does not warrant or represent that the insurance required under this article constitutes an insurance portfolio which adequately addresses all risks faced by the Contractor or its Subcontractors. The Contractor and Subcontractors of every tier shall satisfy themselves as to the existence, extent and adequacy of insurance prior to commencement of work.
- 14.3 The Contractor and any Subcontractor shall procure and maintain for the duration of the Project insurance of the types and limits set forth under this article and such insurance as will protect themselves from claims which may arise out of or result from the Contractor's or Subcontractor'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 Subcontractor will be primary coverage.

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14.4 Workers' Compensation Insurance

Worker's Compensation insurance for all employees on site in accordance with the requirements of the Workers' Compensation law of the State of Maine.

Minimum acceptable limits for Employer's Liability are:

Bodily Injury by Accident.....	\$500,000
Bodily Injury by Disease.....	\$500,000 Each Employee
Bodily Injury by Disease.....	\$500,000 Policy Limit

14.5 Liability Insurance

a) General Liability Insurance

General liability insurance for bodily injury and property damage liability for all hazards of the Project including premise and operations, products and completed operations, contractual, and personal injury liabilities. 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

b) 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, non-owned and hired automobiles, trucks and trailers.

Minimum acceptable limit is:

Any one accident or loss	\$1,000,000
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c) Owners Protective Liability Insurance

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

d) Pollution Liability Insurance

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 Subcontractor 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:

Each occurrence limit.....	\$1,000,000
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14.6 Property Insurance

a) New Construction Only

The Contractor shall procure and maintain Builder's Risk insurance naming the Owner, Contractor and all Subcontractors as insureds as their interest may appear. The covered cause of loss form shall be Risks of Direct Physical Loss, endorsed to include flood, earthquake, testing and ensuing loss and shall include coverage for materials in transit and materials stored off site. Coverage shall be on a replacement cost and a completed value basis. Unless specifically authorized by the Owner, the limit of insurance shall not be less than the contract amount and coverage shall apply during the entire contract period until the Certificate of Substantial Completion is accepted by the Owner.

b) Renovations within and Additions to Existing Buildings Insured by State of Maine Risk Management Division

Insurance shall be provided by the Owner. The Owner shall provide the following Project information to the State of Maine Risk Management Division prior to commencement of the Work in order to initiate the insurance coverage: building name, street address and municipality, brief project description, project start date and completion date, contract dollar value, and Contractor name and address. Said insurance shall name the Contractor and all Subcontractors as insureds as their interest may appear. The covered causes of loss form shall be Risks of Direct Physical Loss, endorsed to include flood, earthquake, testing and ensuing loss and shall include coverage for materials in transit and materials stored off site. Theft coverage is not included and exclusions common to commercial property policies are applicable. The Contractor shall be responsible for a \$500 deductible per occurrence. Unless specifically authorized by the Owner, the limit of insurance shall not be less than the contract amount and coverage shall apply during the entire contract period until the Certificate of Substantial Completion is accepted by the Owner. Verification of insurance will be furnished to the Contractor upon request. The Contractor may independently acquire, at the Contractor's expense, coverage in excess of that maintained by the State of Maine.

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

15. Contract Bonds

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

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16. Allowances

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

17. Assignment of Contract

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

18. Separate Contracts

- 18.1 The Owner reserves the right to create other contracts in connection with this Project using similar General Conditions. The Contractor shall allow the Owner's other contractors reasonable opportunity for the delivery and storage of materials and the execution of their work. The Contractor shall coordinate and properly connect the Work of all contractors.
- 18.2 The Contractor shall promptly report to the Architect and Owner any apparent deficiencies in work of the Owner's other contractors that impacts the proper execution or results of the Contractor. The Contractor's failure to observe or report any deficiencies constitutes an acceptance of the Owner's other contractors work as suitable for the interface of the Contractor's work, except for latent deficiencies in the Owner's other contractors work.
- 18.3 Similarly, the Contractor shall promptly report to the Architect and Owner any apparent deficiencies in their own work that would impact the proper execution or results of the Owner's other contractors.
- 18.4 The Contractor shall report to the Architect and Owner any conflicts or claims for damages with the Owner's other contractors and settle such conflicts or claims for damages by mutual agreement or arbitration, if necessary, at no expense to the Owner.
- 18.5 In the event the Owner's other contractors sue the Owner regarding any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend such proceedings at the Contractor's expense. The Contractor shall pay or satisfy any judgment that may arise against the Owner, and pay all other costs incurred.

19. Subcontracts

- 19.1 The Contractor shall not subcontract any part of this contract without the written permission of the Owner.
- 19.2 The Contractor shall submit a complete list of named Subcontractors and material suppliers to the Architect and Owner for approval by the Owner prior to commencing work. The Subcontractors named shall be reputable companies of recognized standing with a record of satisfactory work.

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- 19.3 The Contractor shall not employ any Subcontractor or use any material until they have been approved, or where there is reason to believe the resulting work will not comply with the Contract Documents.
- 19.4 The Contractor, not the Owner, is as fully responsible for the acts and omissions of Subcontractors and of persons employed by them, as the Contractor is for the acts and omissions of persons directly or indirectly employed by the Contractor.
- 19.5 Neither the Contract Documents nor any Contractor-Subcontractor contract shall indicate, infer or create any direct contractual relationship between any Subcontractor and the Owner.

20. Contractor-Subcontractor Relationship

- 20.1 The Contractor shall be bound to the Subcontractor by all the obligations in the Contract Documents that bind the Contractor to the Owner.
- 20.2 The Contractor shall pay the Subcontractor, in proportion to the dollar value of the work completed by the Subcontractor, the dollar amount allowed to the Contractor at the time each Contractor's Requisition for Payment is approved by the Owner.
- 20.3 The Contractor shall pay the Subcontractor accordingly if the Contract Documents or the subcontract provide for earlier or larger payments than described in the provision above.
- 20.4 The Contractor shall pay the Subcontractor on demand for subcontract work or materials as far as executed and fixed in place, less retainage, at the time the Contractor's Requisition for Payment is approved by the Owner, even if the Architect fails to certify a portion of the Requisition for Payment for a cause not the fault of the Subcontractor.
- 20.5 The Contractor shall not make a claim for liquidated damages or penalty for delay in any amount in excess of amounts that are specified by the subcontract.
- 20.6 The Contractor shall not make a claim for services rendered or materials furnished by the Subcontractor unless written notice is given by the Contractor to the Subcontractor within ten calendar days of the day in which the claim originated.
- 20.7 The Contractor shall give the Subcontractor an opportunity to present and to submit evidence in any progress conference or disputes involving subcontract work.
- 20.8 The Contractor shall pay the Subcontractor a just share of any fire insurance payment received by the Contractor.
- 20.9 The Subcontractor shall be bound to the Contractor by the terms of the Contract Documents and assumes toward the Contractor all the obligations and responsibilities that the Contractor, by those documents, assumes toward the Owner.
- 20.10 The Subcontractor shall submit applications for payment to the Contractor in such reasonable time as to enable the Contractor to apply for payment as specified.
- 20.11 The Subcontractor shall make any claims for extra cost, extensions of time or damages, to the Contractor in the manner provided in these General Conditions for like claims by the Contractor to the Owner, except that the time for the Subcontractor to make claims for extra cost is seven calendar days after the receipt of Architect's instructions.

21. Supervision of the Work

- 21.1 During all stages of the Work the Contractor shall have a competent superintendent, with any necessary assistant superintendents, overseeing the project. The superintendent shall not be reassigned without the consent of the Owner unless a superintendent ceases to be employed by the Contractor due to unsatisfactory performance.

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- 21.2 The superintendent represents the Contractor on the jobsite. Directives given by the Architect or Owner to the superintendent shall be as binding as if given directly to the Contractor's main office. All important directives shall be confirmed in writing to the Contractor. The Architect and Owner are not responsible for the acts or omissions of the superintendent or assistant superintendents.
- 21.3 The Contractor shall provide supervision of the Work equal to the industry's highest standard of care. The superintendent shall carefully study and compare all Contract Documents and promptly report any error, inconsistency or omission discovered to the Architect. The Contractor may not necessarily be held liable for damages resulting directly from any error, inconsistency or omission in the Contract Documents or other instructions by the Architect that was not revealed by the superintendent in a timely way.

22. Observation of the Work

- 22.1 The Contractor shall allow the Owner, the Architect and the Bureau continuous access to the site for the purpose of observation of the progress of the work. All necessary safeguards and accommodations for such observations shall be provided by the Contractor.
- 22.2 The Contractor shall coordinate all required testing, approval or demonstration of the Work. The Contractor shall give sufficient notice to the appropriate parties of readiness for testing, inspection or examination.
- 22.3 The Contractor shall schedule inspections and obtain all required certificates of inspection for inspections by a party other than the Architect.
- 22.4 The Architect shall make all scheduled observations promptly, prior to the work being concealed or buried by the Contractor. If approval of the Work is required of the Architect, the Contractor shall notify the Architect of the construction schedule in this regard. Work concealed or buried prior to the Architect's approval may need to be uncovered at the Contractor's expense.
- 22.5 The Architect may order reexamination of questioned work, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to conform to the Contract Documents, the Owner shall pay the expense of the reexamination and remedial work. If the work is found to not conform to the Contract Documents, the Contractor shall pay the expense, unless the defect in the work was caused by the Owner's Contractor, whose responsibility the reexamination expense becomes.
- 22.6 The Bureau shall periodically observe the Work during the course of construction and make recommendations to the Contractor or Architect as necessary. Such recommendations shall be considered and implemented through the usual means for changes to the Work.

23. Architect's Status

- 23.1 The Architect represents the Owner during the construction period, and observes the work in progress on behalf of the Owner. The Architect has authority to act on behalf of the Owner only to the extent expressly provided by the Contract Documents or otherwise demonstrated to the Contractor. The Architect has authority to stop the work whenever such an action is necessary, in the Architect's reasonable opinion, to ensure the proper execution of the contract.
- 23.2 The Architect is the interpreter of the conditions of the contract and the judge of its performance. The Architect shall favor neither the Owner nor the Contractor, but shall use the Architect's powers under the contract to enforce faithful performance by both parties.

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23.3 In the event of the termination of the Architect's employment on the project prior to completion of the work, the Owner shall appoint a capable and reputable replacement. The status of the new Architect relative to this contract shall be that of the former Architect.

24. Management of the Premises

- 24.1 The Contractor shall place equipment and materials, and conduct activities on the premises in a manner that does not unreasonably hinder site circulation, environmental stability, or any long term effect. Likewise, the Architect's directions shall not cause the use of premises to be impeded for the Contractor or Owner.
- 24.2 The Contractor shall not use the premises for any purpose other than that which is directly related to the scope of work. The Owner shall not use the premises for any purpose incompatible with the proposed work simultaneous to the work of the Contractor.
- 24.3 The Contractor shall enforce the Architect's instructions regarding information posted on the premises such as signage and advertisements, as well as activities conducted on the premises such as fires, and smoking.
- 24.4 The Owner may occupy any part of the Project that is completed with the written consent of the Contractor, and without prejudice to any of the rights of the Owner or Contractor. Such use or occupancy shall not, in and of itself, be construed as a final acceptance of any work or materials.

25. Safety and Security of the Premises

- 25.1 The Contractor shall continuously maintain security on the premises and protect from unreasonable occasion of injury all people authorized to be on the job site. The Contractor shall also effectively protect the property and adjacent properties from damage or loss.
- 25.2 The Contractor shall take all necessary precautions to ensure the safety of workers and others on and adjacent to the site, abiding by applicable local, state and federal safety regulations. The Contractor shall erect and continuously maintain safeguards for the protection of workers and others, and shall post signs and other warnings regarding hazards associated with the construction process, such as protruding fasteners, moving equipment, trenches and holes, scaffolding, window, door or stair openings, and falling materials.
- 25.3 The Contractor shall designate, and make known to the Architect and the Owner, a safety officer whose duty is the prevention of accidents on the site.
- 25.4 The Contractor shall restore the premises to conditions that existed prior to the start of the project at areas not intended to be altered according to the Contract Documents.
- 25.5 The Contractor shall protect existing utilities and exercise care working in the vicinity of utilities shown in the Drawings and Specifications or otherwise located by the Contractor.
- 25.6 The Contractor shall protect from damage existing trees and other significant plantings and landscape features of the site which will remain a permanent part of the site. If necessary or indicated in the Contract Documents, tree trunks shall be boxed and barriers erected to prevent damage to tree branches or roots.
- 25.7 Damage to the Work, including that which is reasonably protected, shall be repaired or replaced at the expense of the party who caused the damage.
- 25.8 The Contractor shall not load, or allow to be loaded, any part of the Project with a force which imperils personal or structural safety. The Architect may consult with the Contractor on such means and methods of construction, however, the ultimate responsibility lies with the Contractor.

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- 25.9 The Contractor shall not jeopardize any work in place with subsequent construction activities such as blasting, drilling, excavating, cutting, patching or altering work. The Architect must approve altering any structural components of the project. The Contractor shall supervise all construction activities carried out by others on site to ensure that the work is neatly done and in a manner that will not endanger the structure or the component parts.
- 25.10 The Contractor may act with their sole discretion in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Contractor may negotiate with the Owner for compensation for expenses due to such emergency work.
- 25.11 The Contractor shall keep the premises free of any unsafe accumulation of waste materials caused by the work. The Contractor shall regularly keep the spaces “broom clean”. See the Close-out of the Work provisions of this section regarding cleaning at the completion of the project.

26. Changes in the Work

- 26.1 The Contractor shall not proceed with extra work without an approved Change Order or Construction Change Directive. A Change Order which has been properly signed by all parties shall become a part of the contract.
- 26.2 A Change Order is the usual document for directing changes in the Work. In certain circumstances, however, the Owner may utilize a Construction Change Directive to direct the Contractor to perform changes in the Work that are generally consistent with the scope of the project. The Owner shall use a Construction Change Directive only when the normal process for approving changes to the Work has failed to the detriment of the Project, or when agreement on the terms of a Change Order cannot be met, or when an urgent situation requires, in the Owner's judgment, prompt action by the Contractor.
- 26.3 The Architect shall prepare the Construction Change Directive representing a complete scope of work, with proposed Contract Price and Contract Time revisions, if any, clearly stated.
- 26.4 The Contractor shall promptly carry out a Construction Change Directive which has been signed by the Owner and the Architect. Work thus completed by the Contractor constitutes the basis for a Change Order. Changes in the Contract Price and Contract Time shall be as defined in the Construction Change Directive unless subsequently negotiated with some other terms.
- 26.5 The method of determining the dollar value of extra work shall be by:
- a) an estimate of the Contractor accepted by Owner as a lump sum, or
 - b) unit prices named in the contract or subsequently agreed upon, or
 - c) cost plus a designated percentage, or
 - d) cost plus a fixed fee.
- 26.6 The Contractor shall determine the dollar value of the extra work for both the lump sum and cost plus designated percentage methods using the following rates. The rates include all overhead and profit expenses.
- a) Contractor - for any work performed by the Contractor's own forces, 20% of the cost;
 - b) Subcontractor - for work performed by Subcontractor's own forces, 20% of the cost;
 - c) Contractor - for work performed by Contractor's Subcontractor, 10% of the amount due the Subcontractor.
- 26.7 The Contractor shall keep and provide records as needed or directed for the cost plus designated percentage method. The Architect shall review and certify the appropriate amount which includes the Contractor's overhead and profit. The Owner shall make payments based on the Architect's certificate.

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- 26.8 Cost reflected in Change Orders shall be limited to the following: cost of materials, cost of delivery, cost of labor (including Social Security, pension, Workers' Compensation insurance, and unemployment insurance), and cost of rental of power tools and equipment. Labor cost may include a pro-ratio share of a foreman's time only in the case of an extension of contract time granted due to the Change Order.
- 26.9 Overhead reflected in Change Orders shall be limited to the following: bond premium, supervision, wages of clerks, time keepers, and watchmen, small tools, incidental expenses, general office expenses, and all other overhead expenses directly related to the Change Order.
- 26.10 The Contractor shall provide credit to the Owner for labor, materials, equipment and other costs but not overhead and profit expenses for those Change Order items that result in a net value of credit to the contract.
- 26.11 The Owner may change the scope of work of the Project without invalidating the contract. The Owner shall notify the Contractor of a change of the scope of work for the Owner's Contractors, which may affect the work of this Contractor, without invalidating the contract. Change Orders for extension of the time caused by such changes shall be developed at the time of directing the change in scope of work.
- 26.12 The Architect may order minor changes in the Work, not involving extra cost, which is consistent with the intent of the design or project.
- 26.13 The Contractor shall immediately give written notification to the Architect of latent conditions discovered at the site which materially differ from those represented in the Drawings or Specifications, and which may eventually result in a change in the scope of work. The Contractor shall suspend work until receiving direction from the Architect. The Architect shall promptly investigate the conditions and respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Architect shall determine if the discovered conditions warrant a Change Order.
- 26.14 The Contractor shall, within ten calendar days of receipt of the information, give written notification to the Architect if the Contractor claims that instructions by the Architect will constitute extra cost not accounted for by Change Order or otherwise under the contract. The Architect shall promptly respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Architect shall determine if the Contractor's claim warrants a Change Order.
27. Correction of the Work
- 27.1 The Contractor shall promptly remove from the premises all work the Architect declares is non-conforming to the contract. The Contractor shall replace the work properly at no expense to the Owner. The Contractor is also responsible for the expenses of others whose work was damaged or destroyed by such remedial work.
- 27.2 The Owner may elect to remove non-conforming work if it is not removed by the Contractor within a reasonable time, that time defined in a written notice from the Architect. The Owner may elect to store removed non-conforming work not removed by the Contractor at the Contractor's expense. The Owner may, with ten days written notice, dispose of materials which the Contractor does not remove. The Owner may sell the materials and apply the net proceeds, after deducting all expenses, to the costs that should have been borne by the Contractor.
- 27.3 The Contractor shall remedy any defects due to faulty materials or workmanship and pay for any related damage to other work which appears within a period of one year from the date of substantial completion, and in accord with the terms of any guarantees provided in the contract.

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The Owner shall promptly give notice of observed defects to the Contractor and Architect. The Architect shall determine the status of all claimed defects.

- 27.4 The Architect may authorize, after a reasonable notification to the Contractor, an equitable deduction from the contract amount in lieu of the Contractor correcting non-conforming or defective work.

28. Owner's Right to do Work

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

29. Termination of Contract and Stop Work Action

- 29.1 The Owner may, owing to a certificate of the Architect indicating that sufficient cause exists to justify such action, without prejudice to any other right or remedy and after giving the Contractor and the Contractor's surety seven days written notice, terminate the employment of the Contractor. At that time the Owner may take possession of the premises and of all materials, tools and appliances on the premises and finish the work by whatever method the Owner may deem expedient. Cause for such action by the Owner includes: if the contractor is adjudged bankrupt, or makes a general assignment for the benefit of its creditors, or if a receiver is appointed due to the Contractor's insolvency, or if the Contractor persistently or repeatedly refuses or fails to provide enough properly skilled workers or proper materials, or if the Contractor fails to make prompt payment to Subcontractors or material or labor suppliers, or if the Contractor persistently disregards laws, ordinances or the instructions of the Architect, or is otherwise found guilty of a substantial violation of a provision of the Contract Documents.
- 29.2 The Contractor is not entitled, as a consequence of the termination of the employment of the Contractor as described above, to receive any further payment until the Work is finished. If the unpaid balance of the contract amount exceeds the expense of finishing the Work, including compensation for additional architectural, managerial and administrative services, such balance shall be paid to the Contractor. If the expense of finishing the Work exceeds the unpaid balance, the Contractor shall pay the difference to the Owner. The Architect shall certify the expense incurred by the Contractor's default. This obligation for payment shall continue to exist after termination of the contract.
- 29.3 The Contractor may, if the Work is stopped by order of any court or other public authority for a period of thirty consecutive days, and through no act or fault of the Contractor or of anyone employed by the Contractor, with seven days written notice to the Owner and the Architect, terminate this contract. The Contractor may then recover from the Owner payment for all work executed, any proven loss and reasonable profit and damage.

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29.4 The Contractor may, if the Architect fails to issue a certificate for payment within seven days after the Contractor's formal request for payment, through no fault of the Contractor, or if the Owner fails to pay to the Contractor within 30 days after submission of any sum certified by the Architect, with seven days written notice to the Owner and the Architect, stop the Work or terminate this Contract.

30. Delays and Extension of Time

30.1 The completion date of the contract shall be extended if the work is delayed by changes ordered in the work which have approved time extensions, or by an act or neglect of the Owner, the Architect, or the Owner's Contractor, or by strikes, lockouts, fire, flooding, unusual delay in transportation, unavoidable casualties, or by other causes beyond the Contractor's control. The Architect shall determine the status of all claimed causes.

30.2 The contract shall not be extended for delay occurring more than seven calendar days before the Contractor's claim made in writing to the Architect. In case of a continuing cause of delay, only one claim is necessary.

30.3 The contract shall not be extended due to failure of the Architect to furnish drawings if no schedule or agreement is made between the Contractor and the Architect indicating the dates which drawings shall be furnished and fourteen calendar days has passed after said date for such drawings.

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

31. Payments to the Contractor

31.1 As noted under *Preconstruction Conference* in this section, the Contractor shall submit a Schedule of Values form, before the first application for payment, for approval by the Owner and Architect. The Architect may direct the Contractor to provide evidence that supports the correctness of the form. The approved Schedule of Values shall be used as a basis for payments.

31.2 The Contractor shall submit an application for each payment ("Requisition for Payment") on a form approved by the Owner and Architect. The Architect may require receipts or other documents showing the Contractor's payments for materials and labor, including payments to Subcontractors.

31.3 The Contractor shall submit Requisitions for Payment as the work progresses not more frequently than once each month, unless the Owner approves a more frequent interval due to unusual circumstances. The Requisition for Payment is based on the proportionate quantities of the various classes of work completed or incorporated in the Work, in agreement with the actual progress of the Work and the dollar value indicated in the Schedule of Values.

31.4 The Architect shall verify and certify each Requisition for Payment which appears to be complete and correct prior to payment being made by the Owner. The Architect may certify an appropriate amount for materials not incorporated in the Work which have been delivered and suitably stored at the site. The Contractor shall submit bills of sale, insurance certificates, or other such documents that will adequately protect the Owner's interests prior to payments being certified.

31.5 In the event any materials delivered but not yet incorporated in the Work have been included in a certified Requisition for Payment with payment made, and said materials thereafter are damaged, deteriorated or destroyed, or for any reason whatsoever become unsuitable or unavailable for use

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- in the Work, the full amount previously allowed shall be deducted from subsequent payments unless the Contractor satisfactorily replaces said material.
- 31.6 The Contractor may request certification of an appropriate dollar amount for materials not incorporated in the Work which have been delivered and suitably stored away from the site. The Contractor shall submit bills of sale, insurance certificates, right-of-entry documents or other such documents that will adequately protect the Owner's interests. The Architect shall determine if the Contractor's documentation for the materials is complete and specifically designated for the Project. The Owner may allow certification of such payments.
- 31.7 Subcontractors may request, and shall receive from the Architect, copies of approved Requisitions for Payment showing the amounts certified in the Schedule of Values.
- 31.8 Certified Requisitions for Payment, payments made to the Contractor, or partial or entire occupancy of the project by the Owner shall not constitute an acceptance of any work that does not conform to the Contract Documents. The making and acceptance of the final payment constitutes a waiver of all claims by the Owner, other than those arising from unsettled liens, from faulty work or materials appearing within one year from final payment or from requirements of the Drawings and Specifications, and of all claims by the Contractor, except those previously made and still unsettled.
- 31.9 The Owner shall retain five percent of each payment due the Contractor as part security for the fulfillment of the contract by the Contractor. The Owner may make payment of a portion of this "retainage" to the Contractor temporarily or permanently during the progress of the Work. The Owner may thereafter withhold further payments until the full amount of the five percent is reestablished. The Contractor may deposit with the Maine State Treasurer certain securities in place of retainage amounts due according to Maine Statute (M.R.S.A. 5, Section 1746).

32. Payments Withheld

- 32.1 The Architect may withhold or nullify the whole or a portion of any Requisitions for Payment submitted by the Contractor in the amount that may be necessary, in his reasonable opinion, to protect the Owner from loss due to any of the following:
- a) defective work not remedied;
 - b) claims filed or reasonable evidence indicating probable filing of claims;
 - c) failure to make payments properly to Subcontractors or suppliers;
 - d) a reasonable doubt that the contract can be completed for the balance then unpaid;
 - e) liability for damage to another contractor.

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

33. Liens

- 33.1 The Contractor shall deliver to the Owner a complete release of all liens arising out of this contract before the final payment or any part of the retainage payment is released. The Contractor shall provide with the release of liens an affidavit asserting each release includes all labor and materials for which a lien could be filed. Alternately, the Contractor, in the event any Subcontractor or supplier refuses to furnish a release of lien in full, may furnish a bond satisfactory to the Owner, to indemnify the Owner against any lien.

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- 33.2 In the event any lien remains unsatisfied after all payments to the Contractor are made by the Owner, the Contractor shall refund to the Owner all money that the latter may be compelled to pay in discharging such lien, including all cost and reasonable attorney's fees.

34. Indemnification

- 34.1 The Contractor shall indemnify and hold harmless the Owner, its officers, agents, and employees from and against any and all claims, liabilities and costs, including reasonable attorney's fees, for any or all injuries to persons, property or claims for money damages arising from the negligent acts or omissions of the Contractor, its employees or agents, officers or subcontractors in the performance of work under this Agreement.

35. Workmanship

- 35.1 The Contractor shall provide materials, equipment, and installed work equal to or better than the quality specified in the Contract Documents and approved in submittal and sample. The installation methods shall be of the highest standards, and the best obtainable from the respective trades. The Architect's decision on the quality of work shall be final.
- 35.2 The Contractor shall know local labor conditions for skilled and unskilled labor in order to apply the labor appropriately to the Work. All labor shall be performed by individuals well skilled in their respective trades.
- 35.3 The Contractor shall perform all cutting, fitting, patching and placing of work in such a manner to allow subsequent work to fit properly, whether that be by the Contractor, the Owner's Contractors or others. The Owner and Architect may advise the Contractor regarding such subsequent work. Notwithstanding the notification or knowledge of such subsequent work, the Contractor may be directed to comply with this standard of compatible construction by the Architect at the Contractor's expense.
- 35.4 The Contractor shall request clarification or revision of any design work by the Architect, prior to commencing that work, in a circumstance where the Contractor believes the work cannot feasibly be completed at the highest quality, or as indicated in the Contract Documents. The Architect shall respond to such requests in a timely way, providing clarifying information, a feasible revision, or instruction allowing a reduced quality of work. The Contractor shall follow the direction of the Architect regarding the required request for information.
- 35.5 The Contractor shall guarantee the Work against any defects in workmanship and materials for a period of one year commencing with the date of the Certificate of Substantial Completion, unless specified otherwise for specific elements of the project. The Work may also be subdivided in mutually agreed upon components, each defined by a Certificate of Substantial Completion.

36. Close-out of the Work

- 36.1 The Contractor shall remove from the premises all waste materials caused by the work. The Contractor shall make the spaces "broom clean" unless a more exactly cleaning is specified. The Contractor shall wash all windows and glass immediately prior to the final inspection, unless otherwise directed.

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- 36.2 The Owner may conduct the cleaning of the premises where the Contractor, duly notified by the Architect, fails to adequately complete the task. The expense of this cleaning may be deducted from the sum due to the Contractor.
- 36.3 The Contractor shall participate in all final inspections and acknowledge the documentation of unsatisfactory work, generally called the "punch list", to be corrected by the Contractor. The Architect shall document the successful completion of the Work in a dated Certificate of Substantial Completion, to be signed by Owner, Architect, and Contractor.
- 36.4 The Contractor shall not call for final inspection of any portion of the Work that is not complete and permanent installed. The Contractor may be found liable for the expenses of individuals called to final inspection meetings prematurely.
- 36.5 The Contractor and all major Subcontractors shall participate in the end-of-warranty-period conference, typically scheduled close to one year after the Substantial Completion date.

37. Date of Completion and Liquidated Damages

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

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

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38. Dispute Resolution

38.1 Mediation

- a) In the event of a dispute between the parties which arises under this Agreement in which the dispute cannot be resolved through informal negotiation, the dispute shall be submitted to a neutral mediator jointly selected by the parties.
- b) Either party may file suit before or during mediation if the party, in good faith, deems it to be necessary to avoid losing the right to sue due to a statute of limitations. If suit is filed before good faith mediation efforts are completed, the party filing suit shall agree to stay all proceedings in the lawsuit pending completion of the mediation process, provided such stay is without prejudice.
- c) In any mediation between the Owner and the Architect, the Owner has the right to consolidate related claims between Owner and Contractor.

38.2 Arbitration

- a) If the dispute is not resolved through mediation, the dispute shall be settled by arbitration. The arbitration shall be conducted before a panel of three arbitrators. Each party shall select one arbitrator; the third arbitrator shall be appointed by the arbitrators selected by the parties. The arbitration shall be conducted in accordance with the Maine Uniform Arbitration Act (“MUAA”), except as otherwise provided in this section.
- b) The decision of the arbitrators shall be final and binding upon all parties. The decision may be entered in court as provided in the MUAA.
- c) The costs of the arbitration, including the arbitrators’ fees shall be borne equally by the parties to the arbitration, unless the arbitrator orders otherwise.
- d) In any arbitration between the Owner and the Architect, the Owner has the right to consolidate related claims between Owner and Contractor.

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Wage Determination Schedule

PART 1- GENERAL

1.1 Related Documents

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

1.2 Summary

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

1.3 Requirements

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

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

THIS DOCUMENT MUST BE CLEARLY POSTED AT THE PERTAINING STATE FUNDED PREVAILING WAGE CONSTRUCTION SITE

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

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

Title of Project -----Campbell Barn Electrical Upgrade

Location of Project --Augusta, Kennebec County

2015 Fair Minimum Wage Rates
Building 2 Kennebec County
(other than 1 or 2 family homes)

<u>Occupation Title</u>	Minimum Wage	Minimum Benefit	Total	<u>Occupation Title</u>	Minimum Wage	Minimum Benefit	Total
Asbestos/Lead Removal Worker	\$14.50	\$0.29	\$14.79	Ironworker - Reinforcing	\$20.00	\$1.23	\$21.23
Backhoe Loader Operator	\$18.00	\$2.23	\$20.23	Ironworker - Structural	\$22.74	\$9.63	\$32.37
Bricklayer	\$23.24	\$1.58	\$24.82	Laborers (Incl. Helpers & Tenders)	\$13.00	\$0.21	\$13.21
Bulldozer Operator	\$18.00	\$2.77	\$20.77	Laborer - Skilled	\$15.57	\$2.68	\$18.25
Carpenter	\$18.75	\$2.98	\$21.73	Loader Operator - Front-End	\$17.00	\$2.68	\$19.68
Carpenter - Acoustical	\$14.50	\$2.30	\$16.80	Mechanic- Maintenance	\$22.50	\$2.93	\$25.43
Carpenter - Rough	\$18.00	\$2.41	\$20.41	Mechanic- Refrigeration	\$22.00	\$3.90	\$25.90
Cement Mason/Finisher	\$18.00	\$1.49	\$19.49	Millwright	\$23.50	\$3.54	\$27.04
Communication Equip Installer	\$23.06	\$3.19	\$26.25	Oil/Fuel Burner Servicer & Installer (Licensed)	\$23.43	\$7.12	\$30.55
Concrete Pump Operator	\$19.00	\$3.35	\$22.35	Painter	\$14.50	\$0.00	\$14.50
Crane Operator =>15 Tons)	\$24.50	\$4.81	\$29.31	Paver Operator	\$20.00	\$2.26	\$22.26
Crusher Plant Operator	\$18.65	\$3.62	\$22.27	Pipe/Steam/Sprinkler Fitter	\$22.20	\$2.92	\$25.12
Dry-Wall Applicator	\$18.50	\$0.96	\$19.46	Plumber (Licensed)	\$24.68	\$3.11	\$27.79
Dry-Wall Taper & Finisher	\$20.00	\$1.26	\$21.26	Plumber Helper/Trainee (Licensed)	\$17.45	\$1.50	\$18.95
Earth Auger Operator	\$22.50	\$8.14	\$30.64	Propane & Natural Gas Servicer & Inst (Licensed)	\$24.00	\$3.10	\$27.10
Electrician - Licensed	\$25.00	\$5.09	\$30.09	Rigger	\$19.00	\$5.52	\$24.52
Electrician Helper/Cable Puller (Licensed)	\$17.67	\$3.32	\$20.99	Roller Operator - Pavement	\$18.75	\$5.25	\$24.00
Elevator Constructor/Installer	\$52.32	\$32.77	\$85.09	Roofer	\$15.75	\$2.15	\$17.90
Excavator Operator	\$18.00	\$1.99	\$19.99	Sheet Metal Worker	\$22.25	\$1.04	\$23.29
Fence Setter	\$14.75	\$0.51	\$15.26	Sider	\$16.00	\$1.73	\$17.73
Flagger	\$9.00	\$0.00	\$9.00	Stone Mason	\$14.50	\$0.29	\$14.79
Floor Layer	\$17.00	\$0.79	\$17.79	Tile Setter	\$21.00	\$4.25	\$25.25
Glazier	\$16.25	\$2.14	\$18.39	Truck Driver - Light	\$17.00	\$1.46	\$18.46
Grader/Scraper Operator	\$20.00	\$4.90	\$24.90	Truck Driver - Medium	\$13.75	\$0.39	\$14.14
HVAC	\$22.46	\$4.28	\$26.74	Truck Driver - Heavy	\$14.50	\$1.17	\$15.67
Insulation Installer	\$19.00	\$2.23	\$21.23	Truck Driver - Tractor Trailer	\$15.92	\$2.73	\$18.65

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

Apprentices - The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at \$50,000 or more and any subcontractors to such a contractor.

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

Determination No: B2-056-2015

A true copy

Filing Date: May 6, 2015

Attest: 

Expiration Date: 12-31-2015

Pamela D Megathlin
Director
Bureau of Labor Standards

BLS 424BU (R2015) (Building 2 Kennebec)

SECTION 01 10 00 - BASIC REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY OF WORK

- A. Project Scope: Briefly described, the work includes, but is not limited to, the following:
1. Lighting system and lighting controls.
 2. Emergency and exit lighting.
 3. Fire alarm system.
- B. Alternates: Alternates quoted on bid forms will be reviewed and accepted or rejected at the Owner's option. Coordinate related work and modify surrounding work as required. Schedule of Alternates:
1. Base Bid:
 2. Alternate No. 1:
 3. Alternate No. 2:

1.2 CONTRACT CONSIDERATIONS

- A. Project Schedule:

<u>EVENT</u>	<u>DATE</u>
Invitation to Bid	May 22, 2015
Prebid Meeting/Site Visit	Tuesday June 9, 2015, 1:00 PM
Deadline for questions	June 11, 2015 2:00 pm
Bid Opening	Tuesday June 16, 2015, 2:00 PM
Award Contract	Tuesday June 23, 2015
Preconstruction Conference	TBD
Final Completion	August 25, 2015

- B. Site Inspection: Visit the site, before submitting bid, to become familiar with the procedural manner, materials, labor, quantities, and expenses involved in completing the work. No allowances for extra work will be granted to accomplish these ends if the need for which could have been foreseen or anticipated by such a visit. Attendance at Prebid Conference is mandatory for all bidders; bids will not be accepted from bidders who did not attend; see project schedule for date and time.
- C. Contractor Use of Premises:
1. Limit use of premises to allow Owner occupancy and use.

2. Safeguard Owner's property at all times from injury or loss in connection with this work. Any damage, loss, or injury shall be made good by the Contractor without cost to the Owner.
3. Coordinate all work with Owner to minimize disruptions and comply with all rules regarding site access. Store materials and equipment only in designated areas and in accordance with Owner's instructions. Confine all work and storage of materials to the area(s) designated by the Owner.

D. Deviations and Discrepancies:

1. These specifications are accompanied by drawings indicating the layout to supply all phases of the job as listed in the Scope and elsewhere in the specifications. Large scale drawings take precedence over small scale drawings.
2. The drawings are intended to indicate only diagrammatically the extent, general character, and approximate locations of the work included. Work indicated but having minor details obviously omitted, shown incorrectly, or not shown, shall be furnished complete to perform the functions intended without additional cost to the Owner.
3. If any departure from the contract drawings is deemed necessary, details of such departures and the reasons therefore shall be submitted as soon as practical and within 30 days after award of the contract to the Engineer for approval. No departures shall be made without the prior written approval of the Engineer.
4. The drawings and these specifications are complementary each to the other and what is called for in one shall be as binding as if called for by both. In the event of a conflict within the contract documents, that which is best, better, or more stringent shall apply.
5. In the event of an obvious misapplication of equipment, material, installation practice, or other work, before proceeding, promptly notify the Engineer, verbally and in writing, who shall promptly review the items and respond similarly as to any needed adjustments.
6. Bidders shall study plans and specifications and in the event there any apparent errors, omissions, conflicts, or ambiguities, shall contact Engineer for clarification prior to submitting their bid.

E. Schedule of Values: Submit schedule of values to Engineer which indicates the contract cost breakdown of labor and materials for significant items of the contract.

F. Applications for Payment:

1. Submit 3 copies of each application on Forms are available at www.maine.gov/bgs/constrpublic/forms.
2. Content and Format: Utilize schedule of values for listing items in application for payment.
3. Payment Period: Monthly.

G. Change Procedures:

1. Change Order Forms: Forms are available at www.maine.gov/bgs/constrpublic/forms.
2. Change order pricing shall be based on contractor's actual cost of labor including taxes and insurance, invoice cost of material plus an allowance for overhead and profit as stated in the Standard General Conditions.
3. No change shall be made from the work, equipment, or materials under this section except as directed in writing by Engineer.
4. All requests for change in contract price and scope shall be accompanied by a breakdown list of materials with unit and extended prices and labor hours with unit and extended price, plus markups that have been applied.

- H. Liability Insurance: Maintain such public liability insurance as required by the General Conditions to adequately protect Owner from all liability under the laws of the State of Maine.

1.3 COORDINATION AND MEETINGS

A. Coordination

1. Coordinate scheduling, submittals, and work of the various sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
2. Verify utility requirement characteristics of operating equipment are compatible with building utilities.
3. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable.
4. In finished areas, conceal pipes, ducts, and wiring within the construction.

B. Conferences and Progress Meetings:

1. Engineer will schedule a preconstruction conference after Notice of Award for all affected parties.
2. When required in an individual specification section, convene a preinstallation conference at project site prior to commencing work of the section.
3. Attend progress meetings scheduled throughout progress of the work at maximum monthly intervals.

1.4 SUBMITTALS

A. Submittal Procedures:

1. Use submittal form to identify project, contractor, subcontractor or supplier; and pertinent contract document references. Collect submittals in booklet form, organized in order of specification section and paragraph.
2. Apply Contractor's stamp, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and contract documents.
3. Identify variations from contract documents and product or system limitations which may be detrimental to successful performance of the completed work.
4. Revise and resubmit submittals as required; identify all changes made since previous submittal.

B. Shop Drawings:

1. Submit in PDF electronic form or the number of opaque reproductions which Contractor requires, plus 3 copies which will be retained by Engineer.

C. Product Data and Samples:

1. Submit the number of product data copies which the Contractor requires, plus 3 copies which will be retained by the Engineer.
2. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this project.
3. When specified, submit samples to illustrate functional and aesthetic characteristics of the product.
4. Disposition of submittals shall not relieve the Contractor from the responsibility for deviations from drawings or specifications, unless such deviations have been submitted in

writing to Engineer itemizing or calling attention to such deviations at time of submission and secured written approval from the Engineer, nor shall such disposition of shop drawings relieve the Contractor from responsibility for errors in such submittals.

5. Note well: Engineer will make a reasonable effort to identify errors contained in submittals, but will not be responsible for Contractor's errors that Engineer did not correct.

D. Manufacturers' Instructions and Certificates:

1. When specified in individual specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for product data.
2. When specified in individual specification sections, submit manufacturers' certificate to Engineer for review, in quantities specified for product data.

1.5 MATERIAL AND EQUIPMENT

A. Products:

1. Means new material, machinery, components, equipment, fixtures, and systems forming the work, but does not include machinery and equipment used for preparation, fabrication, conveying, and erection of the work. Products may also include existing materials or components specifically identified for reuse.
2. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by the contract documents.
3. Use interchangeable components of the same manufacture for similar components.

B. Transport, handle, store, and protect products in accordance with manufacturers' instructions.

C. Product Options and Substitutions:

1. Products specified by reference standards or by description only: Any product meeting those standards or description.
2. Products specified by naming one or more manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
3. Products Specified by naming one or more manufacturers with a provision for substitutions: Submit a request for substitution for any manufacturer not named.
4. In the event a proposed product substitution has been rejected once, no subsequent substitution is permitted and only products submitted as specified will be reviewed.

1.6 ASBESTOS ABATEMENT

- A. If during the course of work, the existence of asbestos or asbestos containing materials is encountered or suspected in the structure or building, promptly notify the Owner and Engineer. The Owner will consult with his Asbestos Consultant regarding removal and encapsulation of the asbestos material. Do not perform any work prior to receipt of special instructions from the Owner.

1.7 QUALITY CONTROL

A. Quality Assurance/Control of Installation:

1. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
2. Comply fully with manufacturers' instructions.

3. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- B. Cutting and Patching Interior:
1. Employ skilled and experienced installers to perform cutting and patching and new work; restore all work with new products.
 2. Submit a written request to Owner and Engineer in advance of cutting or altering structural or building enclosure elements.
 3. Fit work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
 4. Refinish surfaces to match adjacent finishes.
- C. Cutting and Patching Exterior:
1. All grassed areas disturbed by trenching or by emplacement of concrete pads for pad-mounted meters, switches, or transformers, shall be restored to initial grade, unless specially sloped to facilitate drainage near pad-mounted devices, fertilized and seeded.
 2. Patch paving to match existing.
- D. Concrete Pads
1. Provide reinforced concrete pads for equipment as required. Pads shall be 6" in depth for outdoor pads and 4" in depth for indoor pads and be 6" larger than unit being supported.
 2. Cement shall be Portland Cement conforming to ASTM C150 with fine and coarse aggregate conforming to ASTM C33. All concrete shall be 3000 psi, 28 day strength, 6% air, slump 3-5, 565 pounds minimum cement, .47 maximum water content.
 3. Reinforcing bars shall be 40,000 psi yield strength, intermediate grade conforming to ASTM A615 and A160.
- E. References:
1. Conform to reference standard by date of issue current as of date of contract documents.
 2. Should a specified reference standard conflict with contract documents, request clarification from Engineer before proceeding.
- F. Manufacturers' Field Services and Reports:
1. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions and to initiate instructions when necessary.
 2. Report observations and site decisions or instructions that are supplemental or contrary to manufacturers' written instructions.

1.8 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

- A. Temporary Electricity:
1. Connect to existing power service. Power consumption shall not disrupt Owner's need for continuous service. Owner to pay for power consumed.
 2. Provide power outlets for construction operations, branch wiring, distribution boxes, and flexible power cords as required.
- B. Temporary Lighting:
1. Provide and maintain temporary lighting for construction operations.

2. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
 3. Permanent building lighting may be utilized during construction. Repair, clean, and replace lamps at end of construction.
- C. Temporary Heat:
1. Construction to be performed in the summer months, not applicable.
- D. Enclosures:
1. Interior: Provide temporary partitions and ceilings as required to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
 2. Exterior: Provide appropriate barricades and safety warning devices, visible both day and night, to both satisfy any OSHA regulations and to protect passersby, both vehicular and pedestrian, from harm.
- E. Protection of Installed Work:
1. Protect installed work and provide special protection where specified in individual specification sections.
 2. Provide security and facilities to protect work and existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- F. Progress Cleaning:
1. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- G. Removal of Utilities, Facilities, and Controls:
1. Remove temporary above grade or buried utilities, equipment, facilities, materials, prior to final application for payment inspection.
 2. Clean and repair damage caused by installation or use of temporary work.
 3. Restore existing facilities used during construction to original condition.
 4. Offer removed materials to Owner and if refused, dispose of in a legal manner off site.
 5. Do not use Owner's dumpsters for disposal of any materials.
- 1.9 CONTRACT CLOSEOUT
- A. Procedures:
1. Submit written certification that contract documents have been reviewed, work has been inspected, and work is complete in accordance with contract documents and ready for Engineer's inspection.
 2. Submit final application for payment identifying total adjusted contract sum/price, previous payments, and amount remaining due.
- B. Final Cleaning:
1. Execute final cleaning prior to final inspection.
 2. Clean interior and exterior surfaces exposed to view. Vacuum carpeted and soft surfaces.
 3. Clean debris from site, roofs, gutters, downspouts, and drainage systems.
 4. Replace filters of operating equipment.
 5. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- C. Project Record Documents:

1. Maintain on site, one set of contract documents to be utilized for record documents.
2. Record actual revisions to the work. Record information concurrent with construction progress.
3. Specifications: Legibly mark and record at each product section a description of actual products installed.
4. Record Documents and Shop Drawings: Legibly mark each item to record actual construction.
5. Submit documents to Engineer prior to claim for final application for payment.

D. Warranties:

1. Warrant all work and materials for a period of one year commencing with the acceptance by the Owner of the completed installation in accordance with the Contract Documents. Replace any work, materials, equipment, or system, which develops defects within the warranty period, without cost to the Owner.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION

SECTION 26 00 10 – BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Summary of Electrical Work: The electrical work includes, but is not limited to, the following:
 - 1. Lighting system and lighting controls.
 - 2. Emergency and Exit Lighting System.
 - 3. Grounding System.
 - 4. Roughing in and branch circuit wiring.
 - 5. Fire Alarm System.
 - 6. Other work as required to provide a complete and operating system.
- B. Site Inspection: Visit the site, before submitting bid, to become familiar with the procedural manner, materials, labor, quantities, and expenses involved in completing the work. No allowances for extra work will be granted to accomplish these ends if the need for which could have been foreseen or anticipated by such a visit. Bidders shall attend prebid conference, see Section 01 10 00 - Basic Requirements for date and time.
- C. Related Sections:
 - 1. Drawings, Division 00, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUBMITTALS

- A. Submit under procedures given in Section 01 33 00.
- B. Submit shop drawings and product data grouped in sets to include complete submittals of related systems, products, and accessories in a single submittal. Clearly mark each submittal with appropriate specification section and paragraph reference.
- C. Mark dimensions and values in units to match those specified.
- D. Electrical submittals shall be reviewed by, and carry the approval stamp of, the electrical subcontractor and be initialed and dated by the reviewer.
- E. Submit certificate of final inspection and approval from authority having jurisdiction, and record electrical drawings.
- F. Upon request, provide samples for inspection. Samples will be returned after inspection is completed.
- G. Manual: Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Engineer for the Owner two copies of a manual describing the system:
 - 1. Provide manuals in durable plastic ring binders, nominal 8½ x 11" size.
 - 2. Identification on, or readable through, the front cover stating general nature of the manual.
 - 3. A copy of all reviewed submittals and shop drawings.
 - 4. Complete instructions regarding operation and maintenance of all equipment involved.
 - 5. Complete name and address of nearest vendor of replaceable parts.
 - 6. Copy of all guarantees and warranties issued.

7. Where contents of manuals include manufacturer's catalog pages, clearly indicate the precise items included in this installation.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Electrical: Conform to ANSI/NFPA 70, National Electrical Code.
2. Utility: Conform to the standards of:
 - a. Central Maine Power Co. (CMP)
3. Obtain permits and request inspections from local building inspector.

B. Electrical materials, devices, and equipment shall be new. Where standards have been established by the following, they shall conform to those standards as to quality, fabrication, application, and installation and be not less than further required under this specification.

1. Underwriters Laboratories, Inc. (UL).
2. National Electrical Manufacturers Association (NEMA).
3. American National Standards Association (ANSI).
4. National Fire Protection Association (NFPA).
5. Occupational Safety and Health Administration (OSHA).
6. National Electrical Contractors Association (NECA).
7. Fairpoint.
8. Central Maine Power Co. (CMP); "utility company."
9. Standards of local Building Codes, Electrical, and Fire Departments, City of Augusta.

1.4 WORK SEQUENCE & COORDINATION

- A. Install work under this section so as to conform to the progress of the work of other sections. Complete the electrical work as soon as conditions of the building will permit.
- B. Coordinate in advance with other trades the shape, size and position of all necessary openings, sleeves, supports and related and coordinate electrical installation with mechanical equipment, piping and ductwork to avoid conflicts and to provide electric service and wiring as required for a complete and operating system.
- C. Refer to Division 23 for electrical work required for mechanical. Prior to roughing in, verify that the electrical characteristics of the mechanical equipment being provided are compatible with the electric power circuits specified; if in doubt consult Engineer.
- D. Wiring for H&V temperature controls is specified under Division 23 but shall be supervised by and wired to the standards of this section. Coordinate electrical work with controls requirements to provide a complete and operating system.
- E. Supervise installation of wiring provided under Division 23 to ensure that such wiring is installed according to the standards of Division 26. Report discrepancies to Engineer.

1.5 WIRING STANDARD

- A. Follow wiring coding as indicated on the drawings. Use only the approved wiring methods for circuit applications as indicated in Table 1 (unmarked items are not permitted):
- B. Where specifically detailed on drawings, follow wiring method indicated.
- C. In the event an application location is encountered that is not listed in the wiring standards, consult Engineer for instructions.

TABLE 1

		Building Wire & Cables in Raceway							Cable	
	Application Location	RSC	EMT	PVC	Cable Tray	Surface Raceway	Liquidtight	Flex	MC	NM
1	Underground, 5' away from foundation - Primary, concrete encase - Secondary, no concrete	SFBC		BC SFBC SF						
2	In/under concrete slab to 5' away from foundation	SFBC		SFBC						
3	In slab above grade	BC		BC						
4	Exposed outdoor	SFBC								
5	Wet Interior	SFBC	SFBC							
6	Concealed dry interior Wall stud spaces Ceiling void	FBC FBC	FBC FBC							
7	Accessible dry interior Ceiling void Lighting fixture whip Casework	SFBC	FBC				BC BC	BC BC	BC BC	
8	Exposed dry interior Finished space Unfinished space	SFBC	BC			BC		BC	BC	
9	Motor/equipment connection						B	B	B	

Key: S=Secondary Service, F=Feeders, B=Branch Circuits, C=Control Circuits

1.6 SUBSTITUTIONS

- A. Any proposal for a substitution shall be made in writing, including full details for consideration by Engineer. Substitutions will be permitted only by written acceptance of the Engineer.
- B. Acceptance of a proposed substitution by the Engineer shall not relieve the Contractor from his responsibility to provide a satisfactory installation of the Work in accordance with the intent of the plans and specifications and shall not affect his guarantee covering all parts of the work.
- C. Any material or equipment submitted for acceptance which is arranged differently or of a different physical size from that shown or specified shall be accompanied by shop drawings indicating the different arrangements of size and the method of making the various connections to the equipment. The final results shall be compatible with the system as designed.
- D. Electrical materials and equipment have generally been specified by referencing one or more manufacturer's standard product. Materials of similar quality by listed "Acceptable Manufacturers" will generally not be considered a substitute and will be reviewed for conformance with these specifications. Materials not of similar quality, or by manufacturers not listed as acceptable, will be considered a substitute.
- E. In the event a proposed substitution for material or equipment has been rejected, Engineer will only review subsequent submittals for that material or equipment that are not substitutes.

1.7 ENGINEER/ARCHITECT

- A. The term “Engineer” shall refer to the electrical consulting engineer whose seal appears on the electrical drawings for this project and, for the purposes of contractual matters, shall be synonymous with the term “Architect” or “Architect/Engineer.”

1.8 PROJECT/SITE CONDITIONS

- A. Install work in locations shown on drawings, unless prevented by project conditions.
- B. Prepare drawings showing proposed rearrangement of work to meet project conditions, including changes to Work specified in other sections. Obtain permission of Engineer before proceeding.

1.9 ASBESTOS ABATEMENT

- A. If during the course of work, the existence of asbestos or asbestos containing materials is encountered or suspected in the structure or building, promptly notify the Owner and Engineer. The Owner will consult with his Asbestos Consultant regarding removal and encapsulation of the asbestos material. Do not perform any work prior to receipt of special instructions from the Owner.

1.10 WORKMANSHIP

- A. Workmanship shall be by licensed electricians well skilled in the trade. A Master Electrician licensed in the State of Maine shall be on site and supervise all work.
- B. Install all work according to the best practices of the trade and in accordance with NECA -1-2000, “Standard Practices for Good Workmanship in Electrical Construction.”
- C. In the event of a conflict with required codes or an obvious misapplication of equipment, material, wiring practice, or other installation, before proceeding, promptly notify the Engineer. In no event shall any work be installed that is contrary to applicable codes.

1.11 DEVIATIONS AND DISCREPANCIES

- A. The drawings are intended to indicate only diagrammatically the extent, general character, and approximate locations of the electrical work. Work indicated, but having minor details obviously omitted, shall be furnished complete to perform the functions intended without additional cost to the Owner. Follow the architectural, structural, and mechanical drawings so that work under this section is properly installed and coordinated with other sections.
- B. The drawings and specifications are complementary each to the other and what is called for in one shall be as binding as if called for by both. In the event of conflicting information on the electrical drawings, or between or within drawings and specifications, or between trades, that which is better, best, most stringent, or most expensive will govern, except as may otherwise be permitted by Engineer.
- C. Bidders shall study plans and specifications and in the event there are any apparent errors, omissions, conflicts, or ambiguities, shall contact Engineer for clarification prior to submitting their bid.

1.12 TEMPORARY LIGHT AND POWER

- A. Arrange for, obtain permits, and provide temporary lighting and power for the duration of the project. Electric energy consumed under this provision will be paid for by the Owner or General Contractor.

- B. Provide lighting stringers and lamps to provide reasonable general illumination (20 footcandles) in work areas, plus task lighting as needed, outlets for hand tools at accessible locations reasonably spaced (within 40 feet of all work areas), power for motors not larger than 1.5 hp each, and cooperate with trades in other sections to provide adequate temporary facilities.
- C. The use of electric heaters for temporary heating is prohibited.
- D. Conform to NFPA 70, OSHA regulations, and other codes and agencies having jurisdiction.
- E. Coordinate to provide wiring for welding and larger motors or unusual lighting under other sections as needed.
- F. Remove all temporary wiring as soon as possible after it is no longer needed.

1.13 CHANGE ORDERS

- A. No change shall be made from the work, equipment, or materials under this section except as directed in writing by Engineer.
- B. All requests for change in contract price and scope shall be accompanied by a breakdown list of materials with unit and extended prices and labor hours with unit and extended price, plus markups that have been applied.

1.14 RECORD DRAWINGS

- A. Keep in good condition at the job, apart from all other prints used in actual construction, one complete set of diazo blue-line or white print electrical drawings. Record on these drawings, completely and accurately, any and all differences between the work as actually installed and the design as shown on the drawings. Record all changes within one week of the time that the changes are authorized. Record drawings shall be maintained in site construction office and be available for inspection by Engineer. At the completion of the work, deliver Record Drawings in accordance with requirement for submittals.

1.15 TESTING AND TRAINING

- A. Conduct operating test for approval in presence of Engineer. The electrical work shall be demonstrated to operate as specified. Furnish instruments, materials, and personnel required for tests. Notify Engineer at least 10 days in advance of proposed test date.

END OF SECTION

SECTION 26 05 00 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Existing work
2. Grounding and bonding
3. Connection of utilization equipment
4. Supports
5. Identification
6. Conduit and fittings
7. Electrical boxes
8. Wire and cable
9. Cords and caps
10. Wiring devices
11. Electrical tape
12. Terminations

B. Related Sections:

1. Drawings, Division 00, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
2. Section 26 00 10, Basic Electrical Requirements.

1.2 REFERENCES

- A. Conform to requirements of National Electrical Code (NEC) ANSI-C1/NFPA 70-2014
- B. Conform to requirements of National Electrical Safety Code (NESC) ANSI 2007.
- C. Furnish products listed by Underwriters Laboratories, Inc., or other testing firm acceptable to authority having jurisdiction.

1.3 SUBMITTALS

A. Product Data: Provide catalog data for the following:

1. Grounding and bonding devices
2. Supports
3. Anchors
4. Conduit and fittings
5. Electrical boxes
6. Wire and cable
7. Wiring devices
8. Mounting brackets/ceiling channels

- B. Submit product data and shop drawings in booklet form with a separate sheet for each product. Indicate clearly on each sheet product manufacturer, catalog number, product description and other pertinent data.

- C. Test reports.

1. Grounding system continuity and resistance test.
2. Conductor continuity and insulation resistance test.

1.4 PROJECT CONDITIONS

- A. Existing project conditions indicated on drawings are based on casual field observation and existing record documents.
- B. Verify field measurements and circuiting arrangements are as shown on drawings.
- C. Verify removal of existing electric work.
- D. Report discrepancies to Engineer before disturbing existing installation.

1.5 COORDINATION

- A. Obtain and review shop drawings, product data, and manufacturer's instructions for equipment furnished under other sections to determine connection locations and requirements.
- B. Sequence rough-in of electrical connections to coordinate with installation and start up of equipment furnished under other sections.

PART 2 - PRODUCTS

2.1 GROUNDING MATERIALS

- A. Ground Rod: Copper clad steel, 3/4" diameter x 10' length. Die-stamp each near the top with the name or trademark of the manufacturer and the length of the rod in feet. The rods shall have a hard, clean, smooth, continuous, surface throughout the length of the rod.
 1. Galvanized steel rods are permitted where required by Utility Company.
- B. Mechanical Connectors: Bronze.
- C. Compression set connectors and components: Burndy "Hyground" compression system, or approved equal.
- D. Thermit Welds: Cadweld.

2.2 BASIC MATERIALS

- A. Steel Channel: Galvanized or painted steel.
- B. Anchors:
 1. Masonry Anchors: Rawl-Stud, Lok-Bolt, Saber-Tooth, or equal by Arro, Diamond, or Redhead.
 2. Hollow-Wall Anchors: Toggle bolt by Rawl or equal by Arro, Diamond, or Redhead.
 3. Anchors shall have sufficient holding power for intended use.
 4. Plastic anchors and powder actuated anchors are not permitted.
- C. Miscellaneous Hardware: Treat for corrosion resistance.
- D. Nameplates: Engraved three layer laminated plastic (lamicoid), white letters on black background. Embossed plastic adhesive tape labels, with 3/16" white letters on black background.

- E. Wire and Cable Markers: Cloth markers, split sleeve or tubing type.

2.3 METAL CONDUIT

A. Acceptable Manufacturers:

1. Allied Tube and Conduit
2. Wheatland Tube Company
3. Jones and Laughlin
4. Republic Steel
5. Triangle PWC

B. Conduit:

1. Metal Conduit and Tubing: Hot dipped galvanized or sheradized steel.
2. Flexible Conduit: Galvanized steel.
3. Liquidtight Flexible Metallic Conduit: Flexible metal conduit with PVC jacket.

2.4 PLASTIC CONDUIT

A. Acceptable Manufacturers:

1. Carlon
2. National
3. American Pipe & Plastics, Inc.

B. Plastic Conduit:

1. Plastic Conduit: NEMA TC 2; PVC. Use Schedule 40 conduit.

2.5 FITTINGS

A. Manufacturers:

1. Appleton
2. Bridgeport
3. O-Z/Gedney
4. Raco
5. Steel City
6. Thomas and Betts
7. Carlon
8. American Pipe & Plastics, Inc.

B. Conduit Fittings:

1. Metal Fittings and Conduit Bodies: NEMA FB 1.
2. Plastic Fittings and Conduit Bodies: NEMA TC 3.
3. Fittings and Conduit Bodies for RSC: Galvanized steel or malleable iron, couplings and fittings threaded.
4. Fittings for EMT: Watertight, concrete tight, compression style with galvanized or zinc-plated steel body and cadmium plated steel or malleable iron nut like O-Z/Gedney #7075S connector and #6075S coupling for 3/4" trade size. Set screw held connectors and fittings of any type are not permitted
5. Conduit Bodies for EMT: Cast aluminum, galvanized iron or malleable iron bodies.
6. Insulated Bushings: Appleton "BBU".
7. Grounding Bushings: O-Z/Gedney "BLG".

8. Conduit Sealing Bushings: OZ Gedney Type CSB, or approved equal.
9. Fittings for Liquidtight Flexible Metallic Conduit: Galvanized steel or malleable iron, couplings and fittings threaded.
10. Conduit Clamps: Galvanized malleable iron equivalent to O-Z/Gedney 14-G and 15-G Series with clamp back spacer for RSC, and single hole #15-75G malleable or #15-75S galvanized steel clips for EMT.

2.6 ELECTRICAL BOXES

A. Manufacturers:

1. Appleton
2. Crouse Hinds
3. Hoffman
4. Killark
5. Lee Products
6. Raco
7. Square D
8. Steel City

B. Boxes:

1. Sheet Metal: NEMA OS 1; galvanized steel, 4" x 4" x 2" with raised plaster ring and non-gangable 3" H x 3 1/2" D x 2" W per section masonry boxes. Gangable or sectionalizing boxes are not permitted.
2. Cast Metal: Aluminum or cast alloy, deep type "FD", gasket cover, threaded hubs, "Bell" boxes not permitted.

C. Mounting Brackets and Adjustable Ceiling Channels: Galvanized steel of substantial construction to support boxes by bridging between hollow wall studs or ceiling channels, like Caddy #SGB24 screw gun bracket, Caddy #H4 mounting bracket, and B-Line #BA-12 box hanger, or approved equal.

D. Pull Boxes: Code gauge galvanized steel, no prepunched knockouts.

E. Hinged Cover Enclosures: NEMA 250, Type 1, steel enclosure with manufacturer's standard enamel finish and continuous hinge cover, held closed by flush latch operable by screwdriver.

2.7 WIRE AND CABLE

A. Manufacturers:

1. Anaconda
2. Rome Cable
3. General Cable
4. Okonite
5. Phelps Dodge Cable
6. Southwire
7. Triangle PWC

B. Building Wire:

1. Feeders and Branch Circuits Larger Than 6 AWG: Stranded annealed copper conductor, 600 volt insulation, XHHW.

2. Feeders and Branch Circuits 6 AWG and Smaller: Annealed copper conductor, 600 volt insulation, THHN/THWN or XHHW, stranded conductor; use compression set terminals.
3. Control Circuits: Copper, stranded conductor, 600 volt insulation, THHN/THWN.

C. Metal Clad Cable:

1. Metal Clad Cable, Size 12 through 10 AWG: Interlocked galvanized steel armor, stranded annealed copper conductor, 600 volt insulation, rated 60E C, with separate green ground wire, NEC Type MC.

D. Remote Control and Signal Cable:

1. Control Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volt insulation, rated 60E C, individual conductors twisted together, shielded, and covered with PVC jacket.
2. Control Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 60E C, individual conductors twisted together, shielded, and covered with PVC jacket; UL listed.
3. Plenum Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volt insulation, rated 60E C, individual conductors twisted together, shielded, and covered with nonmetallic jacket; UL listed for use in air handling ducts, hollow spaces used as ducts, and plenums.

2.8 TAPE AND TERMINATIONS

A. Manufacturers, Tape:

1. 3M Co., Scotch #33 and #88

B. Manufacturers, Terminations:

1. Dossert
2. Ideal
3. 3M Co.
4. Thomas and Betts

C. Wire Connection Devices/Terminations: Compression set or twist-on type with integral molded insulation and internal metallic compression ring or spiral screw-on connecting device. Twist-on type shall be like Ideal "Wing Nut" series. Push-on type wire terminals are not acceptable.

D. Wire Terminals, Butt Splices: Crimp set with integral insulated sleeve, electro tin plated, fully annealed copper.

2.9 WIRING DEVICES AND WALL PLATES

A. Manufacturers:

1. Bryant
2. Hubbell
3. Arrow-Hart
4. Pass and Seymour
5. General Electric
6. Leviton

B. Wall Switch: AC general use, specification grade, quiet operating snap switch rated 20 amperes and 120/277 volts AC, with plastic toggle handle, ivory color, Hubbell Model 1221.

1. Pilot Light Type: Lighted handle, Model 1221-1L manufactured by Hubbell, or strap mounted lamp in adjacent gang, Model 48071-R manufactured by Bryant.
- C. Receptacle:
1. Provide straight blade receptacles to NEMA WD 1.
 2. Provide locking blade receptacles to NEMA WD 5.
 3. Convenience Receptacle Configuration, general use: Type 5-20 R, specification grade, plastic face, ivory color, Bryant Model 5352.
 4. GFCI Receptacle, general use: Specification grade duplex convenience receptacle with integral ground fault current interrupter, ivory color, Bryant Model GFR53FT.
 5. Specific Purpose Receptacle: Configuration indicated on drawings with ivory nylon face.
- D. Decorative Cover Plate: Ivory smooth rigid nylon or high impact plastic.
- E. Weatherproof Covers: Die cast aluminum, gasketed, duplex receptacle cover, weatherproof when attachment plug is inserted.
- 2.10 CORDS AND CAPS
- A. Straight-blade Attachment Plug: NEMA WD 1.
 - B. Locking-blade Attachment Plug: NEMA WD 5.
 - C. Attachment Plug Configuration: Match receptacle configuration at outlet provided for equipment.
 - D. Cord Construction: Oil resistant thermoset insulated Type SJOW multiconductor flexible cord with identified equipment grounding conductor, suitable for extra hard usage in damp location.
 - E. Cord Size: Suitable for connected load of equipment and rating of branch circuit overcurrent protection.

PART 3 - EXECUTION

3.1 EXISTING ELECTRICAL WORK

- A. Verify that abandoned wiring and equipment serve only abandoned facilities.
- B. Disconnect existing electrical systems in walls, floors, and ceilings indicated for removal.
- C. Coordinate utility service outages and reconnections with Utility Company and Owner.
- D. In any area requiring the work of other trades, carefully remove, store and protect any electrical items in the path of the work and re-install and re-connect after the completion of the other trade's work.
- E. In areas where painting is required, remove all electrical items including, but not limited to, lighting fixtures, devices and cover plates, then reinstall after painting has been completed. In the event any electrical items that were not removed become painted, clean the items, or replace if cleaning cannot be suitably cleaned.
- F. Provide temporary wiring and connections to maintain existing systems in service during construction until replacement circuits and systems are ready for service, including circuits and systems that serve other areas.

1. Existing electrical feeders and branch circuits.
- G. Remove, relocate, and repair existing installations to accommodate new construction.
1. Remove abandoned wiring to source of supply, and/or back to the serving panelboard and turn off breaker and mark as spare in the panelboard directory.
 2. Remove exposed abandoned conduit and boxes, including abandoned conduit above accessible ceiling finishes.
 3. Disconnect abandoned outlets and remove devices.
 4. Provide blank cover for abandoned outlets which are not removed.
 5. Disconnect and remove abandoned panelboards and distribution equipment.
 6. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
 7. Disconnect and remove abandoned luminaires, brackets, stems, hangers, and other accessories.
 8. Disconnect and remove underfloor wiring, cut raceways flush with floor and patch and restore floor surfaces.
- H. Repair adjacent construction and finishes damaged during removal of existing electrical work.
- I. Maintain access to existing, active electrical installations.
- J. Existing wiring, the need for which remains, found in good condition, properly located, and conforming to the specified wiring standard, may continue in service.
- K. Clean and repair existing materials and equipment within limits of work which remain or are to be reused.
1. Panelboards: Clean and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Revise circuit directory.
 2. Do not reuse conduit, wire, and other materials except as specifically noted on the drawings.
- L. Extend existing installations using materials and methods compatible with existing electrical installations, and as specified.
- 3.2 EXAMINATION AND PREPARATION
- A. Verify that the interior of the building has been physically protected from weather.
- B. Verify that supporting surfaces are ready to receive work.
- C. Electrical boxes are shown on drawings, locations are approximate unless dimensioned.
1. Obtain verification from Engineer of floor box locations, and locations of outlets in office and work areas, prior to rough-in.
 2. Elevator System: Determine location of outlets for lights, cab circuits, machines, and equipment installed in elevator pit, shaft, and machine rooms with elevator system installer prior to rough-in.
- D. Make electrical connections to utilization equipment in accordance with equipment manufacturer's instructions.
1. Verify that wiring and outlet rough-in work is complete and that utilization equipment is ready for electrical connection, wiring, and energization.
 2. Make wiring connections in control panel or in wiring compartment of prewired equipment. Provide interconnecting wiring where indicated.

3.3 GROUNDING

- A. Install grounding electrodes and conductors at locations indicated. Install additional rod electrodes as required to meet Regulatory Requirements.
- B. Provide ground bonding as indicated and to meet Regulatory Requirements. Include a separate green ground wire in each branch and feeder circuit and bond to grounding system.
- C. Maintain isolation between neutral and ground conductors in accordance with NEC.
- D. Install grounding system so all conductive materials operate at ground potential and there is a low impedance path to ground in the event of a fault.
- E. Test grounding system for resistance to earth using fall-to-potential method in accordance with IEEE Std. 81. Maximum ground to earth resistance shall not exceed 25 ohms.
- F. Test grounding system continuity resistance (megger); resistance shall not exceed 0.1 ohms.
- G. Submit test reports for ground/earth resistance and continuity resistance.

3.4 SUPPORT SYSTEMS

- A. Install support systems sized and fastened to accommodate weight of equipment and conduit, including wiring, which they carry.
 - 1. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors, beam clamps, and spring steel clips as appropriate for the application.
 - 2. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in sheet metal studs; and wood screws in wood construction.
 - 3. Do not fasten supports to piping, ceiling support wires, ductwork, mechanical equipment, or conduit.
 - 4. Do not use powder actuated anchors.
 - 5. Do not drill structural wood or steel members.
 - 6. Fabricate supports from structural steel or steel channel.
 - 7. Install free standing electrical equipment on concrete pads.
 - 8. Install surface mounted cabinets and panelboards with minimum of four anchors.
 - 9. Provide steel channel supports to stand cabinets 1" off wall in wet locations.
 - 10. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.

3.5 CONDUIT

- A. Size raceways for conductor type installed or for type THW conductors, whichever is larger.
 - 1. Minimum Size Conduit: 3/4".
 - 2. Maximum Size Conduit in Slabs Above Grade: 1"; for conduits larger than 3/4", route so they do not cross each other.
- B. Install all conduit surface mounted unless otherwise indicated. Arrange conduit to maintain headroom and to present neat appearance. Install conduit in accordance with the following:
 - 1. Route exposed raceway parallel and perpendicular to walls and adjacent piping.

2. Maintain minimum 6" clearance to piping and 12" clearance from parallel runs of flues, steam pipes, and heating appliances. Install horizontal raceway runs above water and steam piping.
3. Complete raceway installation before installing conductors.
4. Maintain required fire, acoustic, and vapor barrier rating when penetrating walls, floors, and ceilings. Where indicated on drawings, sleeve penetrations through concrete walls, floors, and ceilings.
5. Group in parallel runs where practical and install on steel channel support system. Maintain spacing between raceways or derate circuit ampacities to NFPA 70 requirements.
6. Use conduit hangers and clamps; do not fasten with wire or perforated pipe straps.
7. Use conduit bodies to make sharp changes in direction.
8. Terminate conduit stubs and box connections with insulated bushings.
9. Steel conduit joints shall be threaded; clamp on or set screw fittings are not permitted.
10. Use suitable caps to protect installed raceway against entrance of dirt and moisture.
11. Provide No. 12 AWG insulated conductor or suitable pull string in empty raceways, except sleeves and nipples.
12. Install expansion joints where raceway crosses building expansion joints, and where necessary to compensate for thermal expansion.
13. Install plastic conduit and tubing in accordance with manufacturer's instructions; thermoweld or cement PVC joints..
14. Use flexible or liquidtight conduit, short as possible, maximum 72 inches, for motor and equipment hookup; always include a separate green ground wire.
15. Use liquidtight conduit for flexible connections in damp or wet locations.
16. Install conduit so condensation will drain and not be trapped.
17. Prevent lodgement of dirt, trash, and mortar; swab all raceways prior to installation of wire and cable.

3.6 BOXES

A. General:

1. Install electrical boxes where shown on the drawings, and as required for splices, taps, wire pulling, equipment connections, and regulatory requirements.
2. Locate and install electrical boxes to maintain headroom and to present neat mechanical appearance.
3. Align wall mounted outlet boxes for switches, thermostats, and similar devices.
4. Coordinate mounting heights and locations of outlets above counters, benches, and back splashes.
5. Install lighting outlets to locate luminaires as shown lighting plan.
6. Use expansion anchors, shields, or toggle bolts to fasten boxes in place. Do not use explosive powder driven anchors, except where specifically permitted by Engineer. Do not use nails or wire for permanent support.
7. Secure boxes to interior wall and partition studs, accurately positioned to allow for surface finish thickness; select raised cover depth to assure proper fit.
8. Use hinged cover enclosure for interior pull and junction boxes larger than 12 inches in any dimension. Install in an accessible location that will allow easy access.
9. Field punch openings in pull boxes using punch/dies of appropriate size. Provide knockout closures for unused openings.

B. Surface mounted applications:

1. Use cast "FD" outlet boxes for all surface mounted applications to 10 feet above finished floor, and for exterior and wet locations.
2. Where pull boxes must be installed in finished areas, consult Engineer to select location, style, and finish. The location shall always be as inconspicuous as possible.

3.7 INSTALLATION OF WIRES AND CABLES

- A. Verify that interior of building has been physically protected from weather, that mechanical work which is likely to injure conductors has been completed and completely and thoroughly swab raceway system before installing conductors.
- B. Use wire not smaller than 12 AWG for power and lighting circuits, and not smaller than 14 AWG for control wiring.
 1. Use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 75 feet; and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet.
- C. Neatly train and secure wiring inside boxes, equipment, and panelboards.
- D. Use UL listed wire pulling lubricant for pulling 4 AWG and larger wires.
- E. Install wiring according to the Wiring Standard, Section 26 00 10, or in another Division 26 Section, or as directed in applicable section. Protect and support exposed cables (where allowed) above accessible ceilings to keep them from resting on ceiling tiles. Use channel, or running boards as necessary to provide support. Do not support wiring on ceiling support wires, unless ceiling installer has provided certification that ceiling support system is rated to carry the additional load of the cables. Install cables to run parallel and perpendicular to building lines; do not run diagonally, leave ample slack cable at turns.
- F. Make splices, taps, and terminations to carry full ampacity of conductors without perceptible temperature rise.
- G. Terminate spare conductors with electrical tape.
- H. Color code all service, feeder, branch, control, and signalling circuit conductors. Color shall be green for grounding conductors and white for neutrals, except where neutrals of more than one system are installed in same raceway or box, the other neutral shall be white with a colored (not green) stripe. Color code ungrounded conductors operating at 120 volts to ground black, red, and blue for Phases A, B, and C and at 277 volts, brown, orange, and yellow respectively.
- I. Terminate all wire joints #10 AWG or smaller with crimp set or twist-on wire terminating device. Use crimp set or bolted "Burndy" or suitable alternate bolted or crimp set device for conductors larger than #10 AWG.
- J. Cover all joints made with non-insulated connecting devices with electrical tape; use Type #88 at any time or #33 whenever the temperature of the joint or the room is above 60EF. Triple wrap joints, each wrap having a 50% overlay.

3.8 CORDS AND CAPS

- A. Install prefinished cord set where connection with attachment plug is indicated or specified, or use attachment plug with suitable strain relief clamps.
- B. Provide suitable strain relief clamps for cord connections to outlet boxes and equipment connection boxes.

- C. Make wiring connections in control panel or in wiring compartment of prewired equipment in accordance with manufacturer's instructions. Provide interconnecting wiring where indicated.
- D. Install disconnect switches, controllers, control stations, and control devices such as limit switches and temperature switches as indicated. Connect with conduit and wiring as indicated.

3.9 DEVICES

- A. Install wiring devices in accordance with manufacturer's instructions.
 - 1. Install wall switches 48" above floor, OFF position down.
 - 2. Install convenience receptacles 18" above floor, 6" above counters and backsplash or as indicated, with grounding pole on top.
 - 3. Install specific purpose receptacles at heights shown on Drawings.
 - 4. Install cord and attachment plug caps on equipment. Size cord for connected load and rating of branch circuit overcurrent protection.
- B. Install wall plates flush and level.
 - 1. Install decorative plates on switch, receptacle, and blank outlets in finished areas, using oversized plates for outlets installed in masonry walls.
 - 2. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

3.10 IDENTIFICATION

- A. Identify electrical distribution and control equipment, and loads served, to meet regulatory requirements and as scheduled.
 - 1. Degrease and clean surfaces to receive nameplates and tape labels.
 - 2. Secure nameplates to equipment fronts using screws, rivets, or adhesive, with edges parallel to equipment lines. Secure nameplate to inside face of recessed panelboard doors in finished locations.
 - 3. Use embossed tape nameplates with 3/16" lettering to identify individual switches and circuit breakers, wall switches, receptacle circuits, and loads served.
 - 4. Use lamoid nameplates with minimum 1/4" lettering to identify distribution and control equipment.
 - 5. Nameplate information shall suitably identify the device or circuit. Any nameplate that is not suitably descriptive in the opinion of the Engineer shall be replaced as directed.
- B. Install wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connections.
 - 1. Use branch circuit or feeder number to identify power and lighting circuits.
 - 2. Use control wire number as indicated on schematic and interconnection diagrams and equipment manufacturer's shop drawings to identify control wiring.

3.11 FIELD QUALITY CONTROL

- A. Perform field inspection and testing of wiring as follows:
 - 1. Inspect wire and cables for physical damage and proper connection.
 - 2. Torque test conductor connections and terminations to manufacturer's recommended values.

3. Perform continuity and insulation resistance (megger) test on all power and equipment feeder and branch circuit conductors. Submit test report tabulating the test performed and the results.
 4. Verify proper phasing connections; check rotation of all motors.
- B. Perform field inspection and testing of devices as follows:
1. Test for proper polarity and ground continuity.
 2. Test GFCI operation according to manufacturer's written instructions.
 3. Replace defective units and retest.
 4. Submit test report.

END OF SECTION

SECTION 26 51 00 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Luminaires and lamp holders
2. Lamps
3. Exit signs
4. Emergency lighting units
5. Occupancy sensor systems
6. Photocell controls

B. Related Documents

1. Drawings, Division 00, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
2. Section 26 00 10, Basic Electrical Requirements.
3. Section 26 05 00, Basic Electrical Materials and Methods.

1.2 REFERENCES

- A. Furnish products listed by Underwriters Laboratories, Inc., ETL Testing Laboratories, or other testing firm acceptable to the Owner.
- B. Conform to requirements of ANSI/NFPA 70.
- C. Conform to requirements of NFPA 101.
- D. Consortium for Energy Efficiency (CEE).
- E. DesignLights Consortium (DLC).

1.3 SUBMITTALS

- A. Submit shop drawings, product data, test data, warranties, and other information as appropriate for the following:
 1. Luminaires
 2. Emergency lighting units
 3. Exit signs
 4. Occupancy sensors
 5. Photocell controls
- B. Shop Drawings: Indicate construction details for products which are not manufacturer's standard, when product data does not adequately describe fixture physical characteristics, or upon request by Engineer.
- C. Product Data: Provide product data for each luminaire and lighting unit.
- D. Submit written warranty for extended warranty items such as batteries and ballasts.

- E. Submit luminaire shop drawings in booklet form with a separate sheet for each luminaire type. Indicate clearly on each sheet the proposed luminaire "type" designation, manufacturer, luminaire, lamp, and ballast designation.
- F. Submittals shall indicate materials, finishes, metal gauges, overall and detail dimensions, sizes of electrical and mechanical connections, fasteners, welds, joints, end conditions, provisions for the work of others and similar information.
- G. A photometric test report showing photometric candlepower distribution, brightness, coefficients of utilization, and paint reflectance shall be included for all fluorescent and HID fixtures. Photometric reports shall be prepared for actual fixture, lamp, lens, and ballast combination. Certify data as that taken under National Bureau of Standards calibrated test conditions according to standards of the Illuminating Engineering Society; upon request, submit photometric test of proposed fixture prepared by an independent testing laboratory such as ETL.
- H. The submittals shall state whether or not the fixture, as an assembly, has been UL tested and approved.
- I. Upon request, submit sample products for inspection. Provide luminaires identical with approved samples; retain approved samples at site for comparison until after all other luminaires have been shipped to site and installed. Transportation charges for samples shall be paid by Contractor. Unapproved samples will be returned at Contractor's expense. Upon notification of disapproval, immediately submit new samples that meet contract requirements.
- J. Upon request by Engineer, provide computerized illumination calculation data for specified interior or exterior areas in digital or isofootcandle format and in such detail as requested.
- K. Operating and Maintenance Instructions: Provide maintenance and operating instructions for battery powered lighting units. Include technical data sheets and parts ordering information for components used in all luminaires.

1.4 QUALITY ASSURANCE

- A. Warrant all lighting and components for one year after acceptance of the work and at no additional cost to the Owner, promptly provide and install replacements for luminaires or components which are defective in materials or workmanship; or repair installed equipment at the job site as necessary to restore first class operating condition. For any time during the warranty period that luminaires are not fully functional due to defects in materials or workmanship, provide, install, and remove suitable temporary lighting. Warrant replacement luminaires in a similar manner for a period of one year following replacement including replacement of defective replacements.
- B. Warrant ballasts, batteries, and occupancy sensors as further specified herein.
- C. Provide products of firms regularly engaged in the manufacture of interior luminaires or components of similar types and ratings to those required. Such products shall have been in satisfactory use in similar applications for not less than two years.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver luminaires and their components to job site, factory assembled and wired to the greatest extent practical, in strict accordance with approved shop drawings, samples, certificates and catalog cuts.
- B. Protect exposed finishes during manufacture, transport, storage and handling; replace damaged materials.

- C. Luminaires shall be stored under cover, above the ground, in clean, dry areas, and be tagged and/or marked as to type and site destination.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide lighting fixtures as listed on the Lighting, Lamping, and Fixture Schedule on the drawings and as specified herein that meet the physical, performance and quality standard exhibited by that fixture. Substitutes shall be equal in all respects including mechanical, electrical, physical, performance, photometric, and quality characteristics except minor variances in construction details which do not affect overall quality or performance are permitted.
- B. Must be qualified by DLC or CEE to meet Efficiency Maine's eligibility requirements.
- C. Accessories: Provide required accessories for mounting and operation of each luminaire as indicated.
 - 1. Thermal Protection: Provide thermal protection devices to meet NFPA 70 requirements.
 - 2. Disconnecting Means: Provide disconnecting means in fluorescent luminaires that utilize double-ended lamps and contain ballast(s) that can be serviced in place.
 - 3. Surface Luminaires: Provide spacers and brackets required for mounting; design for a minimum ambient temperature of 92EF.

2.2 LED LUMINAIRES

- A. Exterior Housing: Diecast aluminum with five stage polyester powder paint finish, electrical components solidly heat-sink mounted to housing, type as described on the drawings.
- B. Shall be approved by DesignLights Consortium, if not, shall have LM-79 and LM-80 testing or shall have 5 year warranty that cover the product if light levels drop below 70% of the initial light output.
- C. Power Supply: 0 - 10v dimming capabilities.
- D. Reflector: Precision injection molded, high specular reflector, minimum photometric performance in accordance with fixtures listed on Lighting Fixture Schedule.

2.3 EXIT SIGNS

- A. LED Exit Sign Fixture with Battery Backup:
 - 1. Lamps: Manufacturer's standard, light emitting diode (LED) type designed to NFPA 101 and 70 marking of egress requirements. Warrant lamps for 5 years full replacement.
 - 2. Input Voltage: 120 volts for normal power, equip with self-contained battery, solid state charger with brown out protection, and test switch.
 - 3. Battery: Sealed nickel cadmium, warrant for five years full replacement, plus additional 7 years prorata.
- B. Construction:
 - 1. Housing: High strength cast aluminum, equip with low profile canopy mount.
 - 2. Housing and Lens in High Abuse Areas: Injection molded polycarbonate.
 - 3. Face: Aluminum or white painted steel stencil face with red letters, 6" high x 3/4" stroke.
 - 4. Directional Arrows: Universal type for field adjustment.

5. Mounting: Universal, for field selection.
6. Mounting in High Abuse Areas: Ceiling or wall as indicated.

2.4 EMERGENCY LIGHTING UNITS

- A. Self-contained emergency lighting unit.
 1. Input Voltage: 120 volts.
 2. Battery: Lead calcium maintenance free type, 3 year full, plus 7 year prorated (total 10 year) warranty. Gelled electrolyte batteries are not permitted.
 3. Battery Charger: Dual rate type, solid state, with low voltage and brown out protection.
 4. Lamps and Lamp holder: LH3-12V halogen, 12 watt.
 5. Housing: Steel with manufacturer's standard finish.
- B. Indicators and Controls: AC ON, RECHARGING; TEST switch, battery charge voltmeter.
- C. Electrical Connection: Hardwired.

2.5 OCCUPANCY SENSOR SYSTEMS

- A. Acceptable Manufacturers:
 1. Hubbell Building Automation
 - a. Hubbell H-Moss Sensor #HMHB21UPCW with Extender #HMH BSA no substitutes.
- B. General
 1. Mount sensors to each interior light fixture to control on/off independantly.
 2. All sensors, control units, transformers, power packs, switchpacks, and relays of the systems shall be UL listed under Section 508 Industrial Control Equipment and conform to applicable portions of the National Electrical Code to provide automatic operation of lights in response to space occupancy, like devices produced by Watt-Stopper or approved equal.
 3. Provide sensors that will be able to detect typical motion (e.g. walking in corridors, writing and computer use in offices) throughout the accessible portions of spaces lighted by controlled luminaires.
 4. Rate system for operation in ambient temperatures up to 115°F.
 5. Time delay, (after occupants are no longer present before lights are automatically switched off), shall be a linear adjustment with a range including at least 30 seconds to 15 minutes. Sensitivity to motion shall be a linear adjustment.
 6. Calibration, time, or sensitivity adjustments shall be accomplished using common hand tools and not require the use of separate keys or pins.
 7. Occupancy sensors and system components shall have a minimum 3-year warranty.
 8. Select components and locate so as to avoid false triggering by heating or cooling systems, computers and VDTs, adjacent spaces and windows.
- C. Calibration and Troubleshooting
 1. Occupant sensor calibration shall be performed by the Contractor prior to system turnover and rechecked and recalibrated three months later (or as recommended by sensor manufacturer). Contractor shall first arrange for and receive on-site training by a representative of the system. Training shall include appropriate maintenance personnel from the building operations staff.

2. Specific instructions for calibration and troubleshooting shall be provided as part of the O&M manual which represents the range of applications (wall mounted, ceiling mounted, open office, small office, rest room, photocell sensing, etc.) on the project.

2.6 PHOTOCCELL SWITCH

- A. UL 773 or UL 773A, hermetically sealed cadmium-sulphide cell rated 240 volts ac, 60 hertz with single-throw contacts rated 1000 watts, and 600 volts.
- B. Mount switch in a cast weatherproof aluminum housing, with swivel arm mount, in a high impact resistant, noncorroding and nonconductive molded plastic housing, with an EEI-NEMA locking-type receptacle.
- C. The switch shall turn on below 3 footcandles and off at 3 to 10 footcandles. A time delay shall prevent accidental switching from transient light sources. Mount a directional lens in front of the cell to prevent fixed light sources from creating a turnoff condition. Aim switch according to manufacturer's recommendations.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine adjacent surfaces to determine that surfaces are ready to receive work.
- B. Install wiring in accordance with Section 26 00 10.
- C. Coordinate with Engineer and Efficiency Maine to obtain energy efficiency incentives.
- D. Install luminaires and accessories in accordance with manufacturer's instructions, as indicated, with equipment, materials, parts, attachments, devices, hardware, hangers, cables, supports, channels, frames and brackets necessary to make a safe, complete, and fully operative installation.
- E. Install luminaires plumb, square, and level with ceiling and walls, in alignment with adjacent luminaires, and secure in accordance with manufacturers' directions and approved shop drawings. Conform to the requirements of National Electrical Code ANSI/NFPA 70.
 1. Specified or indicated mounting heights are to be to the bottom of each luminaire for suspended and ceiling mounted luminaires, and to the center of each luminaire for wall mounted luminaires. Obtain approval of exact mounting for luminaires on the job before installation is commenced and, where applicable, after coordinating with type, style, and pattern of ceiling being installed.
 2. Provide pendant accessory to mount exit signs at height indicated. Use swivel hanger on sloped ceilings.
 3. Support surface mounted luminaires from ceiling grid tee structure; provide auxiliary support laid across top of ceiling tees and fasten to prohibit movement.
 4. Ground non current carrying parts of electrical equipment in accordance with UL and NEC provisions.
- F. Install lighting fixtures where indicated on the plans; plans may be scaled for approximate locations; minor adjustments are permitted to avoid conflicts. Fixture placement that does not conform to the layout indicated shall be corrected; if in doubt about correct placement consult Engineer prior to roughing in. Install all lighting so that it is securely fastened, rows are uniformly spaced and in alignment, and fixture rests flat on mounting surface.
- G. Perform insulation resistance and ground continuity test.

3.2 ADJUSTING AND CLEANING

- A. Align luminaires and clean lenses and diffusers at completion of work.
- B. Aim adjustable luminaires and lamp holders as indicated or as directed.
- C. Adjust directional arrows on exit signs to meet approval of authority having jurisdiction.
- D. Clean paint splatters, dirt, and debris from installed luminaires.
- E. Touch up luminaire and pole finish at completion of work.
- F. Relamp luminaires which have failed lamps at completion of work.

3.3 OWNER INSTRUCTION

- A. Provide on-site training of Owner's personnel in operation of controls systems by a factory trained manufacturer's representative. Include instruction in programming time controls to obtain required control functions. Provide one follow-up visit if necessary.

END OF SECTION

SECTION 28 31 00 – FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. New building fire alarm system, including materials, labor, and services of a manufacturer trained installer, and related work.
2. Final adjustment and test of system.
3. Letter certifying that system has been properly installed and operates in accordance with applicable codes and these specifications.

B. Related Documents:

1. Drawings, Division 00, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
2. Section 26 00 10, Basic Electrical Requirements.
3. Section 26 05 00, Basic Electrical Materials and Methods.

1.2 REFERENCES

1. NFPA 70, National Electrical Code, 2011.
2. NFPA 72, Fire Alarm Code, 2010.
3. NFPA 101, Life Safety Code, 2012.

1.3 SUBMITTALS

A. Deliver submittals as directed in Section 26 00 10 for:

1. Fire alarm control panel
2. Notification device power extenders
3. Manual stations
4. Smoke detectors
5. Monitor modules
6. Control modules
7. Audible/visual devices
8. Telephone dialer
9. Wire and cable

B. Provide shop drawings and product data to indicate system components, size of components, location, floor plan drawings, and full one line schematic of wiring system showing every fire device and building and operation details. Indicate every fire alarm device, wire type, wire size, number of conductors, device location and room name for approval by the local Fire Department, Engineer, and Owner's representative.

C. Subject to authorization of Owner, Engineer may provide building floor plans and device locations in AutoCAD “Dwg” format for use by contractor in preparing shop drawings. If such drawing files are offered, it will be with the understanding that contractor is responsible for any necessary format changes, and that contractor will remove any information not pertinent to contractor’s work, and as may be requested by the Engineer. Contractor’s drawings shall be issued with Contractor’s title block and logo; use of A/E’s title block is prohibited. No extra

cost shall accrue to Owner in the event such files are not offered or for format and/or editing work that may be required.

- D. Submit manufacturer's descriptive literature, operating instructions, and maintenance and repair data.
- E. Have manufacturer submit, on completion of system verification, a point by point check list indicating the date and time of each item inspected and issue a certificate, confirming that the inspection has been completed and the system is installed and functioning in accordance with the specifications.
- F. Submit final test report and letter signed by an authorized representative of the manufacturer and installing company.

1.4 QUALITY ASSURANCE

- A. Approvals:
 - 1. The system shall have proper listing and approval by Underwriters Laboratories, Inc. (UL), and meet UL Standard 864.
- B. Regulatory Requirements:
 - 1. Installation subject to approval, inspection, and test by manufacturer certified installer.
 - 2. Provide equipment listed by UL and FM, tested by a nationally recognized fire test laboratory, and compatible with the integrated fire alarm system.
 - 3. Equipment, wiring, and installation shall meet the requirements of NFPA 70, 72, 101, and Americans with Disabilities Act (ADA).

1.5 WARRANTY

- A. All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included as part of the work.

1.6 POST CONTRACT MAINTENANCE:

- A. Complete maintenance and repair service for the fire alarm system shall be available from a factory trained authorized representative of the manufacturer of the major equipment for a period of five (5) years after expiration of the guaranty.
- B. As part of the submittal, include a quote for a maintenance contract to provide all maintenance, test, and repair described below. Include also a quote of unscheduled maintenance/repair, including hourly rates for technicians trained on this equipment, and response travel costs. Submittals that do not identify all post contract maintenance costs will not be accepted. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty.
- C. Maintenance and testing shall be on a semiannual basis or as required by the AHJ. A preventive maintenance schedule shall be provided by the contractor that shall describe the protocol for preventive maintenance. The schedule shall include:
- D. Systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, waterflow switches and all accessories of the fire alarm system.
- E. Each circuit in the fire alarm system shall be tested semiannually.

1. Each smoke detector shall be tested in accordance with the requirements of NFPA 72 Chapter 5.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Acceptable Manufacturers
 1. Honeywell
 2. Simplex
- B. System: Analog/addressable, annunciated, 24 volt DC, containing a microprocessor based Central Processing Unit (CPU). The CPU shall communicate with and control system equipment such as intelligent detectors, addressable modules, printer, annunciators, and other system controlled devices.
- C. Fire alarm system components shall be by a single acceptable manufacturer, except as specifically approved by Engineer for unusual accessories.
- D. Provide fully supervised wiring and manual fire alarm stations, smoke detectors, audio/visual alarms, station detectors, annunciated circuits, and sprinkler devices.
- E. Design system to operate upon alarm initiation input from manual stations, automatic detectors and sprinkler circuits as follows:
 1. Actuate control panel to cause all evacuation alarm horns to sound in a three pulse temporal pattern per ANSI S3.41, Audible Emergency Evacuation Signal, and evacuation alarm lights to flash throughout the building.
 2. Indicate the zone in alarm on the front of the fire alarm control panel.
 3. Shut down heating and ventilating equipment fans.
 4. Summon the local fire department.
 5. Close doors that are held open electrically.
 6. Activate audible/visual communications for areas of rescue assistance.
 7. Monitor and control computer room pre-action sprinkler system.
- F. Operating power failure or disarrangement of the supervised circuits shall cause an audible signal to sound, and lamp to indicate, until all circuits are restored to normal, except equip the audible signal with a silencing switch. The audible signal shall re-activate in the event of a subsequent trouble event on another circuit.
- G. In the event commercial power is lost, the system shall automatically transfer to standby battery power. Transfer shall not cause disarrangement except trouble lamp shall indicate loss of prime power.
- H. Basic Performance:
 1. Encode alarm, trouble and supervisory signals from all intelligent reporting devices on an NFPA Style 4 (Class B) Signaling Line Circuit (SLC).
 2. Wire Initiation Device Circuits (IDC) to Class A (NFPA Style D) standard.
 3. Wire Notification Appliance Circuits (NAC) to Class A (NFPA Style Z).
 4. Digitized electronic signals shall employ check digits or multiple polling.
 5. A single ground or open on the system SLC shall not cause system malfunction, loss of operating power or the ability to report an alarm.
 6. Alarm signals arriving at the main FACP shall not be lost following a power failure until the alarm signal is processed and recorded.

- I. Manufacturer, or manufacturer's authorized representative shall have a minimum of five years experience and maintain a full-time service office within 150 miles of the building site. Service office shall be staffed with trained technicians and stocked with sufficient spare parts so as to provide repairs within 24 hours of time reported outage.

2.2 CONTROL PANEL

- A. Steel construction, painted manufacturer's standard finish, hinged front cover, key locked, semi-flush mounted with transparent pane(s) to view system status indicators.
- B. Equip panel with:
 - 1. Door mounted, 80 character, backlit LCD display, annunciator.
 - 2. Separate trouble light for each supervised circuit.
 - 3. Trouble buzzer light and trouble silence switch.
 - 4. Separate pilot lamp to supervise standby power.
 - 5. System reset switch.
 - 6. Alarm horn silence switch.
- C. Provide supervision of system as follows: A break or a ground on any supervised circuit causes trouble signal and trouble lamp illumination. Trouble signal silence switch silences buzzer but lamp remains illuminated. On restoration of the system, the trouble signal to remain energized until trouble signal silence switch is restored to normal. On loss of normal AC power, the trouble alarm operates and illuminates emergency power supervisory pilot lamp. Operation of the trouble alarm silence switch silences trouble signal but power supervisory lamp remains illuminated. On restoration of normal power, trouble alarm remains energized until the silence switch is restored to normal.
- D. Provide analog maintenance alert to warn when smoke detector dust accumulation is excessive, and three level (low, medium, high) manual individual detector sensitivity adjustment.
- E. Design control panel with integral digital communicator capable of reporting up to 56 zones or 198 points to a Building Control, State of Maine.
- F. System Capacity and General Operation:
 - 1. Include capability to monitor up to 198 intelligent/addressable devices.
 - 2. Provide Form-C alarm and trouble relays rated at a minimum of 2.0 amps @ 30 VDC. It shall also include four Class B (NFPA Style Y) programmable Notification Appliance Circuits.
 - 3. The system shall support up to 99 programmable EIA-485 driven relays for an overall system capacity of 301 circuits.
 - 4. Include a full featured operator interface control and annunciation panel that shall include a backlit Liquid Crystal Display, individual, color coded system status LEDs, and an alphanumeric keypad for the field programming and control of the fire alarm system.
 - 5. All programming or editing of the existing program in the system shall be achieved without special equipment and without interrupting the alarm monitoring functions of the Fire Alarm Control Panel.
- G. Provide the following features in the FACP:
 - 1. Drift Compensation to extend detector accuracy over life.
 - 2. Sensitivity Test, meeting requirements of NFPA 72, Chapter 5.
 - 3. Maintenance Alert to warn of excessive smoke detector dirt or dust accumulation.
 - 4. System Status Reports to display or printer.
 - 5. Alarm Verification, with verification counters.

6. PAS presignal, meeting NFPA 72 3-8.3 requirements.
7. Rapid manual station reporting (under 2 seconds).
8. Non-Alarm points for general (non-fire) control.
9. Periodic Detector Test, conducted automatically by software.
10. Pre-alarm for advanced fire warning.
11. Cross Zoning with the capability of: counting two detectors in alarm, two software zones in alarm, or one smoke detector and one thermal detector.
12. March time and temporal coding options.
13. Walk Test, with check for two detectors set to same address.
14. UL 1076 Security Monitor Points.
15. Control-By-Time for non-fire operations, with holiday schedules.
16. Day/Night automatic adjustment of detector sensitivity.

H. Central Microprocessor:

1. The Microprocessor shall communicate with, monitor, and control all external interfaces with the control panel. It shall include EPROM for system program storage, non-volatile memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.
2. The microprocessor shall contain and execute all control-by-event programs for specific action to be taken if an alarm condition is detected by the system. Control-by-event equations shall be held in non-volatile programmable memory and shall not be lost even if system primary and secondary power failure occurs.
3. The microprocessor shall also provide a real-time clock for time annotation of system displays, printer, and history file. The time-of-day and date shall not be lost if system primary and secondary power supplies fail. The real time clock may also be used to control non-fire functions at programmed time-of-day, day-of-week, and day-of-year events.

I. Field Wiring Terminal Blocks: Panel I/O wiring terminal blocks shall be a removable, plug-in type and be designed for 18 to 12 AWG wire. Terminal blocks which are permanently fixed are not acceptable.

J. Operator's Controls:

1. Acknowledge Switch:
 - a. Activation of the control panel acknowledge switch in response to new alarms and/or troubles shall silence the local panel sounder, change the alarm and trouble LEDs from flashing mode to steady-on mode. If multiple alarm or trouble conditions exist, depression of this switch shall advance the 80-character LCD display to the next alarm or trouble condition.
 - b. The Acknowledge switch shall also silence all remote annunciator sounders.
2. Signal Silence Switch: Activation of the Signal silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully field programmable as permitted by applicable standards. The FACP software shall include silence inhibit and auto-silence timers.
3. System Reset Switch: The system reset switch shall cause all electronically-latched initiating devices, appliances or software zones, as well as all associated output devices and circuits, to return to their normal condition.
4. Holding the system RESET switch shall perform a lamp test function.

5. Drill (Evacuate) Switch: The drill switch shall activate all notification appliance circuits. The drill function shall latch until the panel is silenced or reset.

K. Field Programming:

1. The system shall be programmable, configurable and expandable in the field without the need for special tools or electronic equipment and not require field replacement of electronic integrated circuits.
2. All programming can be done using the standard FACP keypad.
3. All field defined programs shall be stored in non-volatile memory.
4. The programming function shall be enabled with a password that may be defined specifically for the system when it is installed. Two levels of password protection shall be provided in addition to a key-lock cabinet. The lower level password is used for status level changes such as zone disable or manual on/off commands, and the higher-level is used for actual change of program information.
5. Program edit shall not interfere with normal operation and fire protection. If a fire condition is detected during programming operation, the system shall exit programming and perform fire protection functions as programmed.
6. Provide a special program check function to detect common operator errors.
7. Include an Auto-Program (self-learn) function to quickly install initial functions and make the system operational.
8. Provide an off-line programming with batch upload/download function.
9. Specific System Operations:
 - a. Smoke Detector Sensitivity Adjust: Provide a means to adjust the sensitivity of any or all analog intelligent smoke detectors in the system from the control panel. Sensitivity range shall be within the allowed UL window.
 - b. Alarm Verification: Each intelligent addressable smoke detector in the system shall be independently selected and enabled to be alarm verified. The alarm verification delay shall be programmable from 5 to 30 seconds. The FACP shall keep a count of the number of times that each detector has entered the verification cycle. These counters may be displayed and reset by the proper operator commands.
 - c. Point Disable: Any device in the system may be enabled or disabled through the system keypad.
 - d. Point Read: The system shall be able to display or print the following point status diagnostic functions:
 - 1) Device status.
 - 2) Device types.
 - 3) Custom device labels.
 - 4) View analog detector values.
 - 5) Device zone assignments.
 - 6) All program Parameters.
10. System Status Reports: Upon command by operator, generate a printed status report listing system status.
11. System History Recording and Reporting: Provide a history buffer capable of storing up to 650 system alarms/troubles/operator actions, including time and date stamp of the activation. The contents of the History Buffer may be manually reviewed, one event at a time, or printed in its entirety.
12. Although the foreground history buffer may be cleared for user convenience, a background, non-erasable buffer shall be maintained which provides the last 650 system events.

13. The History Buffer shall use non-volatile memory. Systems that use volatile memory for history storage are not acceptable.
14. Automatic Detector Maintenance Alert: The FACP shall automatically interrogate each intelligent smoke detector and analyze the detector responses over a period of time.
 - a. If any intelligent smoke detector in the system responds with a reading that is below or above normal limits, then the system will enter the Trouble Mode, and the detector will be annunciated on the system display, and printed on the optional printer. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.
15. Pre-alarm Function: The system shall provide two levels of pre-alarm warning to give advance notice of a possible fire situation. Both pre-alarm levels shall be fully field adjustable. The first level shall give an audible indication at the panel. The second level shall give an audible indication and may also activate control relays. The system shall also have the ability to activate local detector sounder bases at the pre-alarm level, to assist in avoiding nuisance alarms.
16. Software Zones: The FACP shall provide 99 software zones. All addressable devices may be field programmed to be grouped into software zones for control activation and annunciation purposes.

L. Display :

1. Provide all the controls and indicators used by the system operator to program all system operational parameters.
2. Include status information and custom alphanumeric labels for all intelligent detectors, addressable modules, and software zones.
3. Provide an 80-character back-lit alphanumeric Liquid Crystal Display (LCD). It shall also provide 5 Light-Emitting-Diodes (LEDs), that will indicate the status of the following system parameters: AC POWER, SYSTEM ALARM, SYSTEM TROUBLE, SIGNAL SILENCED, SUPERVISORY, and PRE-ALARM.
4. Provide a 21-key touch key-pad with control capability to command all system functions, entry of alphabetic or numeric information, and field programming. Two different password levels shall be provided to prevent unauthorized system control or programming.
5. Include the following operator functions: SIGNAL SILENCE, RESET, DRILL, and ACKNOWLEDGE.

M. Signaling Line Circuit (SLC) Interface:

1. The SLC interface shall provide power to and communicate with up to 99 intelligent detectors (Ionization, Photoelectric, or Thermal) and 99 intelligent modules (monitor or control) for a system capacity of 198 devices. This shall be accomplished over a single SLC loop and shall be capable of supporting NFPA 72 Style 4, Style 6, or Style 7 wiring.
2. The loop interface shall receive analog information from all intelligent detectors on the loop to determine whether normal, alarm, or trouble conditions exist for each detector. The software shall automatically maintain the detector's desired sensitivity level by adjusting for the effects of environmental factors, including the accumulation of dust in each detector. The analog information shall also be used for automatic detector testing and for the automatic determination of detector maintenance requirements.
3. The detector software shall meet NFPA 72, chapter 7 requirements and be certified by UL as a calibrated sensitivity test instrument.
4. The detector software shall allow manual or automatic sensitivity adjustment.

N. Serial Interfaces:

1. Provide an EIA-232 interface between the Fire Alarm Control Panel and UL Listed Electronic Data Processing (EDP) peripherals.
 - a. Supports the use of printers, CRT monitors, and PC compatible computers.
 - b. Include special protocol methods that allow off-site monitoring of the FACP over standard dial-up phone lines. This ancillary capability shall allow remote readout of all status information, including analog values, and shall not interfere with or degrade FACP operations when used. It shall allow remote FACP Acknowledge, Reset, or Signal Silence in this mode. It shall also allow adjustment of detector sensitivity and readout of the history file.
2. Provide an EIA-485 interface for the serial connection of remote annunciators and LCD displays that may be used for network connection to a Proprietary Receiving Unit.
3. Protect all interfaces and associated equipment so that they will not be affected by voltage surges or line transients, consistent with UL standard 864.

O. Universal Digital Alarm Communicator Transmitter (UDACT):

1. The UDACT is an interface for communicating digital information between a fire alarm control panel and a UL-Listed central station.
2. It shall be compact in size, and mount in a standard module position of the fire alarm control cabinet.
3. Include connections for dual telephone lines (with voltage detect), per UL/NFPA/FCC requirements, with the ability of split reporting of panel events to up to three different telephone numbers.
4. Completely field programmable from a built-in keypad and 4 character red, seven segment display.
5. Capable of transmitting events in at least 15 different formats. This ensures compatibility with existing and future transmission formats.
6. Communication shall include vital system status such as:
 - a. Independent Zone (Alarm, trouble, non-alarm, supervisory)
 - b. Independent Addressable Device Status
 - c. AC (Mains) Power Loss
 - d. Low Battery and Earth Fault
 - e. System Off Normal
 - f. 12 and 24 Hour Test Signal
 - g. Abnormal Test Signal (per UL requirements)
 - h. EIA-485 Communications Failure
 - i. Phone Line Failure
7. The UDACT shall support independent zone/point reporting when used in the Contact ID format. In this format the UDACT shall support transmission of up to 2,040 points. This enables the central station to have exact details concerning the origin of the fire or response emergency.
8. An optional module shall be available which provides 8 Form-C relays rated at 5.0 amperes. The relays shall track programmable software zones.

2.3 Power Supply:

- A. Provide power supply unit as part of control panel or as separate unit to automatically maintain standby battery bank fully charged under normal conditions and sized to recharge standby

batteries in 12 hours maximum, following emergency operation. Power supply shall operate the system when batteries are disconnected.

1. The Power Supply shall operate on 120 VAC, 60 Hz, and provide all necessary power for the FACP.
 2. It shall produce 5.0 amps of usable Notification appliance power, using a switching 24 VDC regulator. An 3.0 amp Notification expansion power supply shall be available for UL 1971 and ADA devices, for a total system capacity of 8 amps.
 3. Battery charger shall be dual-rate charging type for fast battery recharge and be power-limited per 1995 UL864 standards.
 4. Provide a very low frequency sweep earth detect circuit, capable of detecting earth faults.
 5. Provide optional meters to indicate battery voltage and charging current.
- B. Provide sealed nickel cadmium or lead acid batteries of sufficient capacity to operate system under supervised load conditions without recharging for 24 consecutive hours and then have sufficient power left to operate sounding devices for fifteen minutes. Batteries shall be warranted for 5 years full plus 5 years pro rata, total of 10 years. Mount batteries in the bottom of the FACP or in a steel locked enclosure located 6 inches minimum or 6 feet maximum above floor in a dry, clean location where ambient temperatures will be 40 degrees F maximum. Protect enclosure so that spillage of electrolyte will not damage FACP interior.

2.4 ADDRESSABLE DEVICES - GENERAL

- A. Detectors shall be intelligent and addressable, and connect with two wires to the Fire Alarm Control Panel Signaling Line Circuits.
- B. Provide decade (numbered 0 to 9) rotary decimal switches for address-setting.
- C. Addressable Devices shall use simple to install and maintain type address switches. Devices which use a binary address setting method, such as a dip switch, are not an allowable substitute.
- D. Provide dual alarm and power LEDs on addressable smoke and thermal detectors.
 1. Both LEDs flash under normal conditions to indicate that the detector is operational and in regular communication with the control panel.
 2. Both LEDs shall continuously illuminate indicating that an alarm condition has been detected.
 3. The flashing mode operation of the detector LEDs shall be optional through the system field program.
 4. Provide an output connection in the base to connect an external remote alarm LED.
- E. Provide detector sensitivity adjustment through field programming of the system. Sensitivity shall be automatically adjusted by the panel on a time-of-day basis.
- F. Provide automatic detector compensation for dust accumulation and other slow environmental changes that may affect their performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72, Chapter 7.
- G. The detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature.
- H. Provide the means to test detectors and report to the FACP by activating a built-in magnetic switch, or be initiated remotely on command from the FACP.
- I. Detectors shall also store an internal identifying type code that the control panel shall use to identify the type of device (ION, PHOTO, THERMAL).

2.5 ADDRESSABLE FIRE ALARM BOXES

- A. Manual: Non-coded, single action, flush mounted in new construction, surface mounted on matching back box (do not mount on standard electrical box) in existing construction. Station shall remain in actuated position until reset by key access.
- B. Back Boxes: For recessed applications, provide 4" x 4" x 2.5" deep, or larger, flush back box. For surface mounted applications, provide matching back box so that face of manual station does not overhang the box.
- C. Addressable pull boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. Provide a key operated test-reset lock to restore device to normal use.
- D. Manual stations shall be solidly constructed of Lexan with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches or larger.

2.6 INTELLIGENT PHOTOELECTRIC SMOKE DETECTORS

- A. The detectors shall use the photoelectric light-scattering principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.
- B. Capable of detecting products of combustion without requirements for presence of heat or smoke, unaffected by changes in environmental temperature, humidity, and pressure; semi flush mounted, with indicator lamp, provision for remote mounting, designed for operation on 24 volts DC. Provide complete with plug-in detector base for surface mounting on outlet box.
- C. Furnish duct mounting units complete with duct mounting enclosure and sampling tubes.
- D. Equip detectors with 30 mesh insect screen and closed back to prevent entry of dust and air turbulence and shield electronics to prevent false alarms caused by EMI and RFI.
- E. Design detector to be easily disassembled to facilitate cleaning.

2.7 ADDRESSABLE DRY CONTACT MONITOR MODULE

- A. Provide addressable monitor modules to connect one supervised IDC zone of conventional alarm initiating devices (any N.O. dry contact device) to one of the fire alarm control panel SLCs.
- B. The monitor module shall mount in a 4-inch square, 2-1/8 inch deep electrical box.
- C. The IDC zone shall be suitable for Style D or Style B operation. Include an LED status light as specified above for addressable devices.

2.8 TWO WIRE DETECTOR MONITOR MODULE

- A. Addressable monitor modules shall be provided to connect one supervised IDC zone of conventional 2-wire smoke detectors or other alarm initiating devices (any N.O. dry contact device).
- B. The two-wire monitor module shall mount in a 4-inch square, 2-1/8 inch deep electrical box or with an optional surface backbox.
- C. The IDC zone may be wired for Class A or B (Style D or Style B) operation. Include an LED status light as specified above for addressable devices.

2.9 ADDRESSABLE CONTROL MODULE

- A. Provide addressable control modules to supervise and control conventional NACs of compatible, 24 VDC powered, polarized audio/visual notification appliances or for other auxiliary functions, such as fan shutdown, which require a dry contact relay.
- B. The control module shall mount in a standard 4-inch square (101.6 mm square), 2-1/8 inch (54 mm) deep electrical box, or to a surface mounted backbox.
- C. The control module NAC may be wired for Style Z or Style Y (Class A/B) with up to 1 amp of inductive A/V signal, or 2 amps of resistive A/V signal operation, or as a dry contact (Form-C) relay. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.
- D. Audio/visual power shall be provided by a separate supervised power circuit from the main fire alarm control panel or from a supervised, UL listed remote power supply.
- E. The control module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC.

2.10 ADDRESSABLE RELAY MODULE

- A. Provide addressable relay modules for HVAC control and other building functions as needed. The relay shall be form C and rated for a minimum of 2.0 Amps resistive or 1.0 Amps inductive. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.

2.11 AUDIBLE/VISUAL ALARM DEVICES

- A. Provide combination vibrating horn/flashing strobe alarm devices mounted on a common housing, except where indicated, provide strobe unit without horn. Provide matching back box for all surface mounted units; do not mount on standard electrical box. In flush mounted applications, provide matching back box, or standard electrical box as needed.
- B. Design horns for parallel type operation semi-flush mounted, with audio output of not less than 95 db at 10 feet on axis except 87 db rating may be used where the higher rated output is excessive.
- C. Strobes shall be Xenon flash tube type meeting UL 1971 and NFPA 72 and having a minimum flash intensity of 15 candela polar distribution, or higher where indicated on drawings, with a maximum pulse duration of 0.2 second and maximum duty cycle of 40 percent. Strobes shall meet the ADA required 75 candela on axis distribution. The flash repetition rate shall be a minimum of 1 and maximum of 2 per second. Provide synchronizing control so that strobes in a common area flash simultaneously. Provide higher flash intensity units as indicated and/or as necessary to meet the requirements of NFPA 72 in large spaces.
- D. Back Boxes: For recessed applications, provide 4" x 4" x 2.5" deep, or larger as needed, flush back box. For surface mounted applications, provide matching back box so that face of a/v unit does not overhang the box.

2.12 WIRE AND CABLE

- A. Provide number and size of wires as recommended by the manufacturer of the alarm system, but not less than #18 AWG for initiating device circuits and #14 AWG for notification appliance circuits.

- B. Wire in conduit:
 - 1. Type THHN building wire, minimum #14 AWG, stranded copper conductor, per Section 16050.
 - 2. Twisted or twisted shielded pair, as required by fire alarm system manufacturer, minimum #18 AWG, stranded copper conductor for digital circuits, and #16 AWG for alarm notification circuits, include overall PVC jacket.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install as recommended by the equipment manufacturer and in accordance with NFPA 70, NFPA 72 and local and State codes.
- B. The stations, detectors, audiovisual units, control panel, and batteries are approximately located on the drawings. Minor rearrangements to adjust for appearance and structural conditions are to be expected. Detectors have been arranged on floor plan to meet or exceed code required minimum spacing. Provide additional detectors where location adjustments prevent meeting these requirements. Provide additional audiovisual units as required to meet minimum evacuation alarm audible sound level requirements.
- C. Install fire alarm wires and cable in conduit per Section 26 00 10.
- D. Paint all fire alarm junction boxes red and stencil "FIRE ALARM" on each box cover, including existing boxes.
- E. Fire alarm conductor terminations in control panel and splice cabinets shall be made on terminal strips with a separate point for each conductor. All such strips to be number identified as shown in wiring diagram attached to inside of door of control panel. Connect wiring neatly to terminal strips; bundle wires, neatly arrange in straight runs with square corners and secure with nylon cable straps or lace with jute cord. Set up termination of cabling so that sections of the system may be isolated or shorted out for servicing.
- F. Mount end-of-line resistor for each circuit in control panel.
- G. Provide signal connection to elevator controller.
- H. Mount fire alarm boxes centered at 48 inches above finished floor. Fire alarm boxes shall not protrude more than 0'-4" from the mounting surface, and shall not protrude beyond the sides of the backbox..
- I. Protect smoke detectors from contamination due to construction dust or the like. In the event of false alarms due to dirty detectors, remove all detectors and clean or replace them and reinstall at no extra cost to Owner.
- J. Mount audiovisual devices 6'-8" AFF to underside of visual device, but not less than 1'-0" below ceilings. Any wall mounted device mounted less than 6'-8" AFF shall not protrude more than 0'-4" from the mounting surface.

3.2 FIELD QUALITY CONTROL

- A. Provide the service of a competent and NICET certified factory-trained technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system. All testing shall be in accordance with NFPA 72, Chapter 7.

- B. Technician shall make a thorough inspection of the complete installed fire alarm systems including operation of all components such as manual stations, thermal detectors, smoke detectors, sprinkler flow valves, and controls, and open each circuit at its most remote point to ensure the following:
 - 1. Complete and functional system.
 - 2. Underwriters Laboratories requirements.
 - 3. Installed in accordance with manufacturer's instructions.
 - 4. Regulations covering supervision of components are adhered to.
 - 5. Make changes necessary to conform to Items 1, 2, 3, and 4 with technical assistance from the manufacturer.
- C. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation and perform the following:
 - 1. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.
 - 2. Verify activation of all flow switches.
 - 3. Open initiating device circuits and verify that the trouble signal actuates.
 - 4. Open and short signaling line circuits and verify that the trouble signal actuates.
 - 5. Open and short Notification Appliance Circuits and verify that trouble signal actuates.
 - 6. Ground all circuits and verify response of trouble signals.
 - 7. Check presence and audibility of tone at all alarm notification devices.
 - 8. Check installation, supervision, and operation of all intelligent smoke detectors using the Walk Test.
- D. Introduce each of the alarm conditions that the system is required to detect. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
- E. At the final inspection, technician shall demonstrate that the systems functions properly in every respect.

3.3 INSTRUCTION:

- A. Provide a typewritten "Sequence of Operation" and instruction as required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.
- B. Have fire alarm technician prepare a test report certifying that the system has been successfully tested in accordance with these specifications and regulatory requirements.
- C. Submit manufacturer's warranty for equipment and wiring to be free from mechanical and electrical defects for a period of one year from the date of acceptance. At the conclusion of the warranty period, manufacturer's technician shall re-inspect and service the system and furnish a letter to the Owner certifying that 100% of the system is operating properly.

END OF SECTION