

Harriman

Dorothea Dix
Psychiatric Center
Bathroom Renovations
Bangor, Maine

Project No. 20458

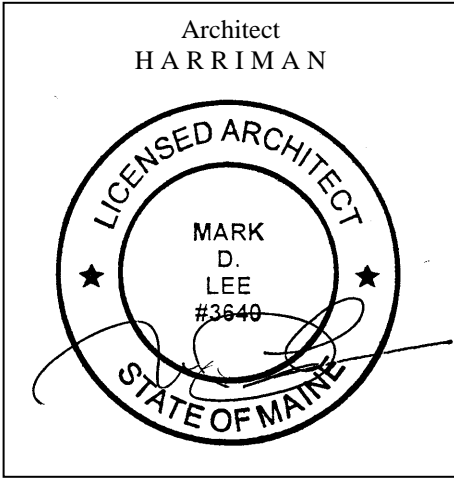
September 25, 2023

Construction Documents

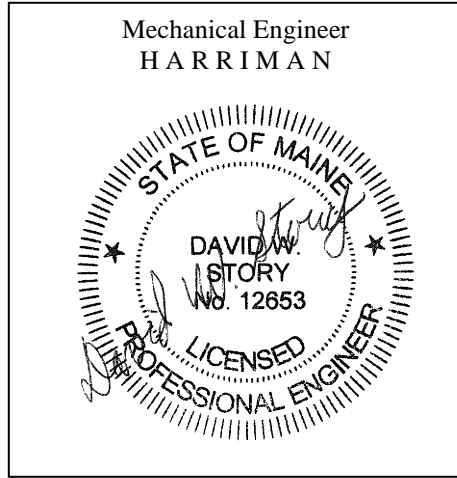
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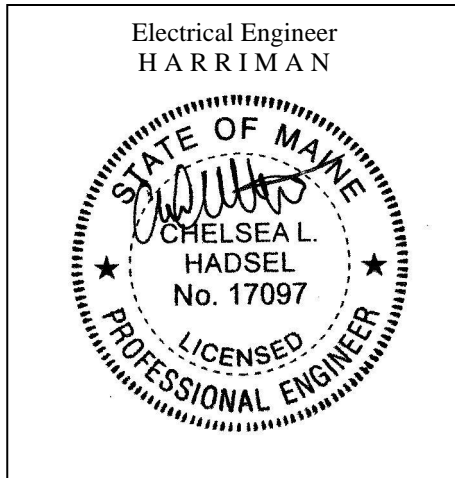
Architect
HARRIMAN



Mechanical Engineer
HARRIMAN



Electrical Engineer
HARRIMAN



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DOROTHEA DIX
PSYCHIATRIC CENTER
BATHROOM RENOVATIONS
Bangor, Maine

TABLE OF CONTENTS

PROCUREMENT REQUIREMENTS

001113 - Notice to Contractors
002113 - Instructions to Bidders
004113 - Contractor Bid Form
004313 - Contractor Bid Bond

CONTRACTING REQUIREMENTS

005213 - Contract Agreement
006113.13 - Contractor Performance Bond
006113.26 - Subcontractor Payment Bond
007100 - Definitions
007213 - General Conditions
007346 - Davis Bacon Wage Rates
Wage Rate Sheet

DIVISION 01 - GENERAL REQUIREMENTS

010010 – Division 1 – Limited Scope
012300 - Alternates

DIVISIONS 02 – 05 - Not used.

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

061000 Rough Carpentry
064000 Architectural Woodwork
064500 Shower Pans and Surrounds

DIVISION 07 – Not used.

DIVISION 08 - OPENINGS

085113 Aluminum Impact Windows

DIVISION 09 - FINISHES

092950 Gypsum Board Assemblies
096516 Resilient Sheet Flooring
099000 Painting

DIVISION 10 - SPECIALTIES

102800 - Toilet Accessories
108500 - Building Specialties

DIVISION 11 – Not used.

DIVISION 12 - FURNISHINGS

123661.16 Solid Surface Countertops

DIVISIONS 13 - 21

Not Used

DIVISION 23 - HEATING VENTILATING AND AIR CONDITIONING

230500 Common Work Results for HVAC
230593 Testing, Adjusting and Balancing for HVAC
233113 Metal Ducts

DIVISION 26 - ELECTRICAL

260100 – Short Form Electrical Specifications

DIVISION 27 - COMMUNICATIONS

275223 Nurse Call – Code Blue Systems

DIVISIONS 28 – 33

Not Used

LIST OF DRAWINGS

G00-1 COVER SHEET

ARCHITECTURAL DRAWINGS

A00-1 ABBREVIATIONS AND LEGENDS
A05-1 DEMOLITION PLANS
A05-2 DEMOLITION PLANS
A05-4 ENLARGED DEMOLITION PLANS
A05-5 ENLARGED DEMOLITION PLANS
A10-1 FLOOR PLANS
A10-2 FLOOR PLANS
A10-3 ALTERNATE 1 ELEVATIONS
A10-4 ALTERNATE 2 FLOOR PLANS
A10-5 ALTERNATE 2 DEMOLITION PLANS
A10-6 ALTERNATE 2 CEILING PLANS
A10-7 ALTERNATE 2 INTERIOR ELEVATIONS

TABLE OF CONTENTS

| | |
|-------|---------------------------------|
| A10-8 | ALTERNATE 2 INTERIOR ELEVATIONS |
| A11-1 | ENLARGED FLOOR PLANS |
| A11-2 | ENLARGED FLOOR PLANS |
| A30-1 | PARTITION TYPES |
| A61-1 | ROOM FINISH SCHEDULE |
| A70-1 | CEILING PLANS |
| A70-2 | CEILING PLANS |
| A82-3 | INTERIOR ELEVATIONS |
| A82-4 | INTERIOR ELEVATIONS |
| A82-5 | INTERIOR ELEVATIONS |
| A82-6 | INTERIOR ELEVATIONS |

FIRE PROTECTION DRAWINGS

| | |
|-------|-------------------------------------------------------|
| F05-1 | FIRST FLOOR DEMOLITION FIRE PROTECTION PLANS |
| F05-2 | SECOND & THIRD FLOOR DEMOLITION FIRE PROTECTION PLANS |
| F10-1 | FIRST FLOOR FIRE PROTECTION PLANS |
| F10-2 | SECOND & THIRD FLOOR FIRE PROTECTION PLANS |

PLUMBING DRAWINGS

| | |
|-------|----------------------------------------|
| P00-1 | LEGEND |
| P05-1 | FIRST FLOOR DEMOLITION PLANS |
| P05-2 | SECOND & THIRD FLOOR DEMOLITION PLANS |
| P10-1 | FIRST FLOOR PLANS |
| P10-2 | SECOND & THIRD FLOOR PLANS |
| P10-3 | BUILDING A & B FLOOR PLANS ALTERNATE 1 |
| P60-1 | SCHEDULES |

MECHANICAL DRAWINGS

| | |
|-------|-----------------------------------------|
| M00-1 | LEGEND & GENERAL NOTES |
| M05-1 | ALTERNATE 2 BUILDING D DEMOLITION PLAN |
| M05-2 | BUILDING K FIRST FLOOR DEMOLITION PLAN |
| M05-3 | BUILDING K SECOND FLOOR DEMOLITION PLAN |
| M05-4 | BUILDING K THIRD FLOOR DEMOLITION PLAN |
| M10-1 | ALTERNATE 2 BUILDING D FIRST FLOOR PLAN |
| M10-2 | BUILDING K FIRST FLOOR PLAN |
| M10-3 | BUILDING K SECOND FLOOR PLAN |
| M10-4 | BUILDING K THIRD FLOOR PLAN |
| M10-5 | ALTERNATE 1 PLAN BUILDINGS A & B |

ELECTRICAL DRAWINGS

| | |
|-------|--------------------------------------|
| E00-1 | ELECTRICAL SYMBOLS AND ABBREVIATIONS |
| E05-1 | FLOOR PLAN DEMOLITION |
| E05-2 | FLOOR PLAN DEMOLITION |
| E05-3 | ALTERNATE 1 PLAN BUILDINGS A & B |
| E05-4 | ALTERNATE 2 PLAN BUILDING D |
| E20-1 | FLOOR PLAN POWER LTG |
| E20-2 | FLOOR PLAN POWER LTG |
| E60-1 | ELECTRICAL SCHEDULES |
| E70-1 | ELECTRICAL DETAILS |

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00 11 13
Notice to Contractors

Bathroom Renovations at Dorothea Dix Psychiatric Center

PT3078

Upgrade existing bathrooms to be ligature resistant and upgrade finishes, fixtures, sprinklers and lighting on the first, second & third floors of Building K. Add Alternate #1 to include single bathrooms in Building A and Building B. Add Alternate #2 to include upgrading bathrooms on the first floor of Building D.

The cost of the work is approximately \$ 980,000. The contract shall designate the Substantial Completion Date on or before *24 May 2024*, and the Contract Final Completion Date on or before *31 May 2024*.

1. Bids shall be submitted in sealed envelopes plainly marked "**Bid for Bathroom Renovations at Dorothea Dix Psychiatric Center**" and addressed to the Bid Administrator:

*Mark C. Faulkner
Director of Facilities
Dorothea Dix Psychiatric Center
656 State Street
Bangor, Maine 04402*

The envelope shall contain a completed Contractor Bid Form, plus bid security when required, to be received no later than **2:00:00 p.m. on Friday, October 20, 2023**. Bid submissions will be opened and read aloud at *the address shown above* at the time and date noted above.

Any bid submitted after the noted time will not be considered a valid bid and will remain unopened. Any bid submitted by any other means will not be considered a valid bid.

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.
If noted above as required, the Bidder shall include a satisfactory Bid Bond (section 00 43 13) or a certified or cashier's check for 5% of the bid amount with the completed bid form submitted to the Owner. The Bid Bond form is available on the BGS website.
4. Performance and Payment Bonds *are required* on this project.
If noted above as required, or if any combination of Base Bid and Alternate Bids amounts selected in the award of the contract exceeds \$125,000.00, the selected Contractor shall furnish a 100% contract Performance Bond (section 00 61 13.13) and a 100% contract Payment Bond (section 00 61 13.16) in the contract amount to cover the execution of the Work. Bond forms are available on the BGS website.
5. Filed Sub-bids *are not required* on this project.
6. There *are no* Pre-qualified General Contractors on this project.
If Pre-qualified General Contractors are identified for this project, the name of each company, with their city and state, are listed below.

00 11 13
Notice to Contractors

7. An on-site pre-bid conference *will* be conducted for this project. If a pre-bid conference is scheduled, it is *mandatory* for General Contractors and optional for Subcontractors and suppliers. Contractors who arrive late or leave early for a mandatory meeting may be prohibited from participating in this meeting and bidding. *The pre-bid conference is scheduled for Thursday, September 28, 2023 at 10:00 AM. Contractors shall meet in the front lobby.*
8. Bid Documents - full sets only - will be available on or about *September 25, 2023* and may be obtained *at no cost if you download from the BGS webpage, which is where the contractor will need to find any addenda that are issued. The contractor has the option to obtain at a cost of \$150 for a hard copy, \$75 for an electronic file transfer only or \$225 for both with the convenience that any addenda will be sent directly to the bidder at no cost from:*
- Harriman*
46 Harriman Drive
Auburn, Maine 04210
207-784-5100 and jlapierre@ harriman.com
9. Bid Documents may be examined at:
- | | |
|--------------------------------------------|--------------------------------------------|
| <i>AGC Maine</i> | <i>Construction Summary</i> |
| <i>188 Whitten Road</i> | <i>734 Chestnut Street</i> |
| <i>Augusta, ME 04330</i> | <i>Manchester, NH 03104</i> |
| <i>Phone 207-622-4741 Fax 207-622-1625</i> | <i>Phone 603-627-8856 Fax 603-627-4524</i> |
- Dodge Analytics*

00 21 13
Instructions to Bidders

1. Bidder Requirements

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

00 21 13
Instructions to Bidders

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

2. Authority of Owner
 - 2.1 The Owner reserves the right to accept or reject any or all bids as may best serve the interest of the Owner.

 - 2.2 Subject to the Owner's stated right to accept or reject any or all bids, the Contractor shall be selected on the basis of the lowest dollar value of an acceptable Base Bid, or any combination of Base Bid plus Alternate Bids, as well as other limited cost modifications the Owner determines may best serve the interests of the Owner. An acceptable bid is a duly submitted bid from a responsive and responsible bidder.

 - 2.3 The Owner reserves the right to require Bid Bonds or Performance and Payment Bonds for any project of any contract value.

3. Submitting Bids and Bid Requirements
 - 3.1 Each bid shall be submitted on the forms provided in the Bid Documents.

 - 3.2 Each bid shall be valid for a period of thirty calendar days following the Project bid closing date and time. The bid expiration date may be extended in unusual circumstances by mutual consent of the Bidder and the Owner. The bid amount shall not be modified due to the bid expiration date extension.

 - 3.3 Any provision contained in a bid which shows cost escalation, or any modification of schedule or other requirements shall not be accepted. Such a provision causes the bid to be invalid, or, at the discretion of the Owner and BGS, that element of the bid submission may be disregarded for the purpose of awarding the contract without that provision.

 - 3.4 Bidders shall include a Bid Bond or other approved bid security with the bid form submitted to the Owner when the bid form indicates such bid security is required. The bond value shall be 5% of the bid amount. The form of bond is shown in section 00 43 13.

 - 3.5 Bidders recognize that inclusion of contract bonds and the cost of those bonds is dependent on the awarded contract dollar value. Therefore, a Base Bid, or any combination of Base Bid plus Alternate Bids, as well as other limited cost modifications, resulting in a contract award shall include the cost of Performance and Payment Bonds in the submitted bid amount when the construction contract value is over \$125,000.00. Similarly, the cost of Performance and Payment Bonds is excluded in the submitted bid amount when the construction contract value is \$125,000.00 or less unless bonds are specifically required by the Bid Documents. When required for the project, the selected Contractor shall provide these bonds before a contract can be executed, pursuant to 14 M.R.S.A., Section 871, Public Works Contractors' Surety Bond Law of 1971, subsection 3. The form of bonds is shown in section 00 61 13.13 and 00 61 13.16.

00 21 13
Instructions to Bidders

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

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**00 41 13
Contractor Bid Form**

Bathroom Renovations at Dorothea Dix Psychiatric Center

PT3078

Bid Form submitted by: *paper documents only to address below*

Bid Administrator:

Mark C. Faulkner
Director of Facilities
Dorothea Dix Psychiatric Center
656 State Street
Bangor, Maine 04402

Mark.Faulkner@Maine.gov

Bidder:

Signature: _____

Printed name and title: _____

Company name: _____

Mailing address: _____

City, state, zip code: _____

Phone number: _____

Email address: _____

State of incorporation, if a corporation: _____

List of all partners, if a partnership: _____

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

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

**00 41 13
Contractor Bid Form**

1. The Bidder, having carefully examined the Bathroom Renovations at Dorothea Dix Psychiatric Center Project Manual dated September 8, 2023, prepared by Harriman, as well as Specifications, Drawings, and any Addenda, the form of contract, and the premises and conditions relating to the work, proposes to furnish all labor, equipment and materials necessary for and reasonably incidental to the construction and completion of this project for the **Base Bid** amount of:

\$ _____ .00

2. Allowances *are not included* on this project.
No Allowances

\$ 0.00

3. Alternate Bids *are included* on this project.
Alternate Bids are as shown below
Any dollar amount line below that is left blank by the Bidder shall be read as a bid of **\$0.00**.

1 *Alternate 1 Buildings A & B Toilet Rooms* \$ _____ .00

2 *Alternate 2 Building D First Floor Toilet Rooms* \$ _____ .00

3 *"not used"* \$ _____ .00

4 *"not used"* \$ _____ .00

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

5. Filed Sub-bids *are not required* on this project.
If noted above as required, the Bidder shall include with this bid form a list of each Filed Sub-bidder selected by the Bidder on the form provided (section 00 41 13F).

**00 43 13
Contractor Bid Bond**

Bond No.: insert bond number

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

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

Now therefore:

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

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

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

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

**00 43 13
Contractor Bid Bond**

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

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

Contractor

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

Surety

(Signature)

insert name and title

insert company name

*insert address
insert city state zip code*

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

**State of Maine
CONSTRUCTION CONTRACT**

Large Construction Project

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

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

BGS Project No.: number assigned by BGS Other Project No.: _____

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

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

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

ARTICLE 1 COMPENSATION AND PAYMENTS

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

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

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

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

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

ARTICLE 2 COMMENCEMENT AND COMPLETION DATES

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

2.2 The Substantial Completion Date shall be _____.

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

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

ARTICLE 3 INELIGIBLE BIDDER

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

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

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

ARTICLE 4 CONTRACTOR'S RESPONSIBILITIES

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

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

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

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

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

ARTICLE 5 OWNER'S RESPONSIBILITIES

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

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

ARTICLE 6 INSTRUMENTS OF SERVICE

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

ARTICLE 7 MISCELLANEOUS PROVISIONS

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

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

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

ARTICLE 8 CONTRACT DOCUMENTS

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

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

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

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

BGS Project No.: _____

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

OWNER

CONTRACTOR

Signature *Date*
name and title

Signature *Date*
name and title

name of contracting entity
address

name of contractor company
address

telephone
email address

telephone
email address
Vendor Number

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

| | | | |
|------------------------------------------------|----------------------|------------------------------------------------------|----------------------|
| <i>select proper approval authority</i> | | | |
| Reviewed by: | | Approved by: | |
| _____ <i>Signature</i> | _____ <i>Date</i> | _____ <i>Signature</i> | _____ <i>Date</i> |
| <i>insert name</i> | | <i>Joseph H. Ostwald</i> | |
| <i>Project Manager/ Contract Administrator</i> | | <i>Director, Planning, Design & Construction</i> | |

00 61 13.13
Contractor Performance Bond

Bond No.: insert bond number

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

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

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

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

**00 61 13.13
Contractor Performance Bond**

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

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

Contractor

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

Surety

(Signature)

insert name and title

insert company name

insert address

insert city state zip code

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

00 61 13.26
Subcontractor Payment Bond

Bond No.: insert bond number

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

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

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

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

**00 61 13.26
Subcontractor Payment Bond**

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

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

Subcontractor

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

00 71 00
Definitions

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

00 71 00
Definitions

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

00 71 00
Definitions

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

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

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

00 71 00
Definitions

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

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

00 71 00
Definitions

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

00 72 13
General Conditions

Table of Contents of this General Conditions Section

1. Preconstruction Conference2

2. Intent and Correlation of Contract Documents.....2

3. Additional Drawings and Specifications3

4. Ownership of Contract Documents3

5. Permits, Laws, and Regulations3

6. Taxes4

7. Labor and Wages.....4

8. Indemnification5

9. Insurance Requirements5

10. Contract Bonds.....6

11. Patents and Royalties7

12. Surveys, Layout of Work7

13. Record of Documents.....7

14. Allowances8

15. Shop Drawings8

16. Samples8

17. Substitutions8

18. Assignment of Contract.....9

19. Separate Contracts.....9

20. Subcontracts10

21. Contractor-Subcontractor Relationship10

22. Supervision of the Work.....11

23. Observation of the Work11

24. Consultant's Status.....12

25. Management of the Premises12

26. Safety and Security of the Premises13

27. Changes in the Work14

28. Correction of the Work.....15

29. Owner's Right to do Work.....16

30. Termination of Contract and Stop Work Action16

31. Delays and Extension of Time17

32. Payments to the Contractor18

33. Payments Withheld19

34. Liens19

35. Workmanship19

36. Close-out of the Work20

37. Date of Completion and Liquidated Damages21

38. Dispute Resolution21

00 72 13
General Conditions

1. Preconstruction Conference

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

2. Intent and Correlation of Contract Documents

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

00 72 13
General Conditions

3. Additional Drawings and Specifications

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

4. Ownership of Contract Documents

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

5. Permits, Laws, and Regulations

- 5.1 The Owner is responsible for obtaining any zoning approvals or other similar local project approvals necessary to complete the Work, unless otherwise specified in the Contract Documents.
- 5.2 The Owner is responsible for obtaining Maine Department of Environmental Protection, Maine Department of Transportation, or other similar state government project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 5.3 The Owner is responsible for obtaining any federal agency project approvals necessary to complete the Work, unless otherwise indicated in the Contract Documents.
- 5.4 The Owner is responsible for obtaining all easements for permanent structures or permanent changes in existing facilities.
- 5.5 The Contractor is responsible for obtaining and paying for all permits and licenses necessary for the implementation of the Work. The Contractor shall notify the Owner of any delays, variance or restrictions that may result from the issuing of permits and licenses.
- 5.6 The Contractor shall comply with all ordinances, laws, rules and regulations and make all required notices bearing on the implementation of the Work. In the event the Contractor observes disagreement between the Drawings and Specifications and any ordinances, laws, rules and regulations, the Contractor shall promptly notify the Consultant in writing. Any necessary changes shall be made as provided in the contract for changes in the work. The Contractor shall not perform any work knowing it to be contrary to such ordinances, laws, rules and regulations.
- 5.7 The Contractor shall comply with local, state and federal regulations regarding construction safety and all other aspects of the Work.
- 5.8 The Contractor shall comply with the Maine Code of Fair Practices and Affirmative Action, 5 M.R.S. §784 (2).

00 72 13
General Conditions

6. Taxes

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

7. Labor and Wages

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

00 72 13
General Conditions

charges pertaining to this Project. Before final payments are made, the Contractor shall furnish to the Owner affidavits that all such payments described above have been made.

- 7.8 The Contractor may contact the Maine Department of Labor, 54 State House Station, Augusta, Maine 04333 for guidance on labor issues.
- 7.9 The Contractor may contact the Maine Workers' Compensation Board, 27 State House Station, Augusta, Maine 04333 for guidance on workers' compensation issues.

8. Indemnification

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

9. Insurance Requirements

- 9.1 The Contractor shall provide, with each original of the signed Contract, an insurance certificate or certificates acceptable to the Owner and BGS. The Contractor shall submit insurance certificates to the Owner and BGS at the commencement of this Contract and at policy renewal or revision dates. The certificates shall identify the project name and BGS project number, and shall name the Owner as certificate holder and as additional insured for general liability and automobile liability coverages. The submitted forms shall contain a provision that coverage afforded under the insurance policies will not be canceled or materially changed unless at least ten days prior written notice by registered letter has been given to the Owner and BGS.
- 9.2 The Owner does not warrant or represent that the insurance required herein constitutes an insurance portfolio which adequately addresses all risks faced by the Contractor or its Subcontractors. The Contractor is responsible for the existence, extent and adequacy of insurance prior to commencement of work. The Contractor shall not allow any Subcontractor to commence work until all similar insurance required of the Subcontractor has been confirmed by the Contractor.
- 9.3 The Contractor shall procure and maintain primary insurance for the duration of the Project and, if written on a Claims-Made basis, shall also procure and maintain Extended Reporting Period (ERP) insurance for the period of time that any claims could be brought. The Contractor shall ensure that all Subcontractors they engage or employ will procure and maintain similar insurance

00 72 13
General Conditions

in form and amount acceptable to the Owner and BGS. At a minimum, the insurance shall be of the types and limits set forth herein protecting the Contractor from claims which may result from the Contractor’s execution of the Work, whether such execution be by the Contractor or by those employed by the Contractor or by those for whose acts they may be liable. All required insurance coverages shall be placed with carriers authorized to conduct business in the State of Maine by the Maine Bureau of Insurance.

9.3.1 The Contractor shall have Workers’ Compensation insurance for all employees on the Project site in accordance with the requirements of the Workers’ Compensation law of the State of Maine. Minimum acceptable limits for Employer’s Liability are:

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

9.3.2 The Contractor shall have Commercial General Liability insurance providing coverage for bodily injury and property damage liability for all hazards of the Project including premise and operations, products and completed operations, contractual, and personal injury liabilities. The policy shall include collapse and underground coverage as well as explosion coverage if explosion hazards exist. Aggregate limits shall apply on a location or project basis. Minimum acceptable limits are:

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

9.3.3 The Contractor shall have Automobile Liability insurance against claims for bodily injury, death or property damage resulting from the maintenance, ownership or use of all owned, non-owned and hired automobiles, trucks and trailers. Minimum acceptable limit is:

| | |
|--------------------------------|-----------|
| Any one accident or loss | \$500,000 |
|--------------------------------|-----------|

9.3.4 For the portion of a project which is new construction, the Contractor shall procure and maintain Builder’s Risk insurance naming the Owner, Contractor, and any Subcontractor as insureds as their interest may appear. Covered causes of loss form shall be all Risks of Direct Physical Loss, endorsed to include flood, earthquake, transit and sprinkler leakage where sprinkler coverage is applicable. Unless specifically authorized in writing by the Owner, the limit of insurance shall not be less than the initial contract amount, for the portion of the project which is new construction, and coverage shall apply during the entire contract period and until the work is accepted by the Owner.

9.3.5 The Contractor shall have Owner’s Protective Liability insurance for contract values \$50,000 and above, naming the Owner as the Named Insured. Minimum acceptable limits are:

| | |
|------------------------------|-------------|
| General aggregate limit..... | \$2,000,000 |
| Each occurrence limit..... | \$1,000,000 |

10. Contract Bonds

10.1 When noted as required in the Bid Documents, the Contractor shall provide to the Owner a Performance Bond and a Payment Bond, or "contract bonds", upon execution of the contract. Each bond value shall be for the full amount of the contract and issued by a surety company authorized to do business in the State of Maine as approved by the Owner. The bonds shall be

00 72 13
General Conditions

executed on the forms furnished in the Bid Documents. The bonds shall allow for any subsequent additions or deductions of the contract.

- 10.2 The contract bonds shall continue in effect for one year after final acceptance of the contract to protect the Owner's interest in connection with the one year guarantee of workmanship and materials and to assure settlement of claims for the payment of all bills for labor, materials and equipment by the Contractor.

11. Patents and Royalties

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

12. Surveys, Layout of Work

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

13. Record of Documents

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

00 72 13
General Conditions

14. Allowances

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

15. Shop Drawings

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

16. Samples

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

17. Substitutions

- 17.1 The Contractor shall furnish items and materials described in the Contract Documents. If the item or material specified describes a proprietary product, or uses the name of a manufacturer, the term "or approved equal" shall be implied, if it is not included in the text. The specific item or material specified establishes a minimum standard for the general design, level of quality, type, function, durability, efficiency, reliability, compatibility, warranty coverage, installation factors

00 72 13
General Conditions

and required maintenance. The Drawing or written Specification shall not be construed to exclude other manufacturers products of comparable design, quality, and efficiency.

- 17.2 The Contractor may submit detailed information about a proposed substitution to the Consultant for consideration. Particular models of items and particular materials which the Contractor asserts to be equal to the items and materials identified in the Contract Documents shall be allowed only with written approval by the Consultant. The request for substitution shall include a cost comparison and a reason or reasons for the substitution.
- 17.3 The Consultant may request additional information about the proposed substitution. The approval or rejection of a proposed substitution may be based on timeliness of the request, source of the information, the considerations of minimum standards described above, or other considerations. The Consultant should briefly state the rationale for the decision. The decision shall be considered final.
- 17.4 The duration of a substitution review process can not be the basis for a claim for delay in the Schedule of the Work.

18. Assignment of Contract

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

19. Separate Contracts

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

00 72 13
General Conditions

20. Subcontracts

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

21. Contractor-Subcontractor Relationship

- 21.1 The Contractor shall be bound to the Subcontractor by all the obligations in the Contract Documents that bind the Contractor to the Owner.
- 21.2 The Contractor shall pay the Subcontractor, in proportion to the dollar value of the work completed and requisitioned by the Subcontractor, the approved dollar amount allowed to the Contractor no more than seven days after receipt of payment from the Owner.
- 21.3 The Contractor shall pay the Subcontractor accordingly if the Contract Documents or the subcontract provide for earlier or larger payments than described in the provision above.
- 21.4 The Contractor shall pay the Subcontractor for completed and requisitioned subcontract work, less retainage, no more than seven days after receipt of payment from the Owner for the Contractor's approved Requisition for Payment, even if the Consultant fails to certify a portion of the Requisition for Payment for a cause not the fault of the Subcontractor.
- 21.5 The Contractor shall not make a claim for liquidated damages or penalty for delay in any amount in excess of amounts that are specified by the subcontract.
- 21.6 The Contractor shall not make a claim for services rendered or materials furnished by the Subcontractor unless written notice is given by the Contractor to the Subcontractor within ten calendar days of the day in which the claim originated.
- 21.7 The Contractor shall give the Subcontractor an opportunity to present and to submit evidence in any progress conference or disputes involving subcontract work.

00 72 13
General Conditions

- 21.8 The Contractor shall pay the Subcontractor a just share of any fire insurance payment received by the Contractor.
- 21.9 The Subcontractor shall be bound to the Contractor by the terms of the Contract Documents and assumes toward the Contractor all the obligations and responsibilities that the Contractor, by those documents, assumes toward the Owner.
- 21.10 The Subcontractor shall submit applications for payment to the Contractor in such reasonable time as to enable the Contractor to apply for payment as specified.
- 21.11 The Subcontractor shall make any claims for extra cost, extensions of time or damages, to the Contractor in the manner provided in these General Conditions for like claims by the Contractor to the Owner, except that the time for the Subcontractor to make claims for extra cost is seven calendar days after the receipt of Consultant's instructions.

22. Supervision of the Work

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

23. Observation of the Work

- 23.1 The Contractor shall allow the Owner, the Consultant and the Bureau continuous access to the site for the purpose of observation of the progress of the work. All necessary safeguards and accommodations for such observations shall be provided by the Contractor.
- 23.2 The Contractor shall coordinate all required testing, approval or demonstration of the Work. The Contractor shall give sufficient notice to the appropriate parties of readiness for testing, inspection or examination.
- 23.3 The Contractor shall schedule inspections and obtain all required certificates of inspection for inspections by a party other than the Consultant.

00 72 13
General Conditions

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

00 72 13
General Conditions

- 25.4 The Owner may occupy any part of the Project that is completed with the written consent of the Contractor, and without prejudice to any of the rights of the Owner or Contractor. Such use or occupancy shall not, in and of itself, be construed as a final acceptance of any work or materials.
26. Safety and Security of the Premises
- 26.1 The Contractor shall designate, and make known to the Consultant and the Owner, a safety officer whose duty is the prevention of accidents on the site.
- 26.2 The Contractor shall continuously maintain security on the premises and protect from unreasonable occasion of injury all people authorized to be on the job site. The Contractor shall also effectively protect the property and adjacent properties from damage or loss.
- 26.3 The Contractor shall take all necessary precautions to ensure the safety of workers and others on and adjacent to the site, abiding by applicable local, state and federal safety regulations. The Contractor shall erect and continuously maintain safeguards for the protection of workers and others, and shall post signs and other warnings regarding hazards associated with the construction process, such as protruding fasteners, moving equipment, trenches and holes, scaffolding, window, door or stair openings, and falling materials.
- 26.4 The Contractor shall restore the premises to conditions that existed prior to the start of the project at areas not intended to be altered according to the Contract Documents.
- 26.5 The Contractor shall protect existing utilities and exercise care working in the vicinity of utilities shown in the Drawings and Specifications or otherwise located by the Contractor.
- 26.6 The Contractor shall protect from damage existing trees and other significant plantings and landscape features of the site which will remain a permanent part of the site. If necessary or indicated in the Contract Documents, tree trunks shall be boxed and barriers erected to prevent damage to tree branches or roots.
- 26.7 The Contractor shall repair or replace damage to the Work caused by the Contractor's or Subcontractor's forces, including that which is reasonably protected, at the expense of the responsible party.
- 26.8 The Contractor shall not load, or allow to be loaded, any part of the Project with a force which imperils personal or structural safety. The Consultant may consult with the Contractor on such means and methods of construction, however, the ultimate responsibility lies with the Contractor.
- 26.9 The Contractor shall not jeopardize any work in place with subsequent construction activities such as blasting, drilling, excavating, cutting, patching or altering work. The Consultant must approve altering any structural components of the project. The Contractor shall supervise all construction activities carried out by others on site to ensure that the work is neatly done and in a manner that will not endanger the structure or the component parts.
- 26.10 The Contractor may act with their sole discretion in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Contractor may negotiate with the Owner for compensation for expenses due to such emergency work.

00 72 13
General Conditions

- 26.11 The Contractor and Subcontractors shall have no responsibility for the identification, discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous materials in any form at the project site. The Contractor shall avoid disruption of any hazardous materials or toxic substances at the project site and promptly notify the Owner in writing on the occasion of such a discovery.
- 26.12 The Contractor shall keep the premises free of any unsafe accumulation of waste materials caused by the work. The Contractor shall regularly keep the spaces "broom clean". See the Close-out of the Work provisions of this section regarding cleaning at the completion of the project.
27. Changes in the Work
- 27.1 The Contractor shall not proceed with extra work without an approved Change Order or Construction Change Directive. A Change Order which has been properly signed by all parties shall become a part of the contract.
- 27.2 A Change Order is the usual document for directing changes in the Work. In certain circumstances, however, the Owner may utilize a Construction Change Directive to direct the Contractor to perform changes in the Work that are generally consistent with the scope of the project. The Owner shall use a Construction Change Directive only when the normal process for approving changes to the Work has failed to the detriment of the Project, or when agreement on the terms of a Change Order cannot be met, or when an urgent situation requires, in the Owner's judgment, prompt action by the Contractor.
- 27.3 The Consultant shall prepare the Construction Change Directive representing a complete scope of work, with proposed Contract Price and Contract Time revisions, if any, clearly stated.
- 27.4 The Contractor shall promptly carry out a Construction Change Directive which has been signed by the Owner and the Consultant. Work thus completed by the Contractor constitutes the basis for a Change Order. Changes in the Contract Price and Contract Time shall be as defined in the Construction Change Directive unless subsequently negotiated with some other terms.
- 27.5 The method of determining the dollar value of extra work shall be by:
- .1 an estimate of the Contractor accepted by Owner as a lump sum, or
 - .2 unit prices named in the contract or subsequently agreed upon, or
 - .3 cost plus a designated percentage, or
 - .4 cost plus a fixed fee.
- 27.6 The Contractor shall determine the dollar value of the extra work for both the lump sum and cost plus designated percentage methods so as not to exceed the following rates. The rates include all overhead and profit expenses.
- .1 Contractor - for any work performed by the Contractor's own forces, up to 20% of the cost;
 - .2 Subcontractor - for work performed by Subcontractor's own forces, up to 20% of the cost;
 - .3 Contractor - for work performed by Contractor's Subcontractor, up to 10% of the amount due the Subcontractor.
- 27.7 The Contractor shall keep and provide records as needed or directed for the cost plus designated percentage method. The Consultant shall review and certify the appropriate amount which

00 72 13
General Conditions

- includes the Contractor's overhead and profit. The Owner shall make payments based on the Consultant's certificate.
- 27.8 Cost reflected in Change Orders shall be limited to the following: cost of materials, cost of delivery, cost of labor (including Social Security, pension, Workers' Compensation insurance, and unemployment insurance), and cost of rental of power tools and equipment. Labor cost may include a pro-ratio share of a foreman's time only in the case of an extension of contract time granted due to the Change Order.
- 27.9 Overhead reflected in Change Orders shall be limited to the following: bond premium, supervision, wages of clerks, time keepers, and watchmen, small tools, incidental expenses, general office expenses, and all other overhead expenses directly related to the Change Order.
- 27.10 The Contractor shall provide credit to the Owner for labor, materials, equipment and other costs but not overhead and profit expenses for those Change Order items that result in a net value of credit to the contract.
- 27.11 The Owner may change the scope of work of the Project without invalidating the contract. The Owner shall notify the Contractor of a change of the scope of work for the Owner's Contractors, which may affect the work of this Contractor, without invalidating the contract. Change Orders for extension of the time caused by such changes shall be developed at the time of directing the change in scope of work.
- 27.12 The Consultant may order minor changes in the Work, not involving extra cost, which is consistent with the intent of the design or project.
- 27.13 The Contractor shall immediately give written notification to the Consultant of latent conditions discovered at the site which materially differ from those represented in the Drawings or Specifications, and which may eventually result in a change in the scope of work. The Contractor shall suspend work until receiving direction from the Consultant. The Consultant shall promptly investigate the conditions and respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Consultant shall determine if the discovered conditions warrant a Change Order.
- 27.14 The Contractor shall, within ten calendar days of receipt of the information, give written notification to the Consultant if the Contractor claims that instructions by the Consultant will constitute extra cost not accounted for by Change Order or otherwise under the contract. The Consultant shall promptly respond to the Contractor's notice with direction that avoids any unnecessary delay of the Work. The Consultant shall determine if the Contractor's claim warrants a Change Order.
28. Correction of the Work
- 28.1 The Contractor shall promptly remove from the premises all work the Consultant declares is non-conforming to the contract. The Contractor shall replace the work properly at no expense to the Owner. The Contractor is also responsible for the expenses of others whose work was damaged or destroyed by such remedial work.

00 72 13
General Conditions

- 28.2 The Owner may elect to remove non-conforming work if it is not removed by the Contractor within a reasonable time, that time defined in a written notice from the Consultant. The Owner may elect to store removed non-conforming work not removed by the Contractor at the Contractor's expense. The Owner may, with ten days written notice, dispose of materials which the Contractor does not remove. The Owner may sell the materials and apply the net proceeds, after deducting all expenses, to the costs that should have been borne by the Contractor.
- 28.3 The Contractor shall remedy any defects due to faulty materials or workmanship and pay for any related damage to other work which appears within a period of one year from the date of substantial completion, and in accord with the terms of any guarantees provided in the contract. The Owner shall promptly give notice of observed defects to the Contractor and Consultant. The Consultant shall determine the status of all claimed defects. The Contractor shall perform all remedial work without unjustifiable delay in either the initial response or the corrective action.
- 28.4 The Consultant may authorize, after a reasonable notification to the Contractor, an equitable deduction from the contract amount in lieu of the Contractor correcting non-conforming or defective work.
29. Owner's Right to do Work
- 29.1 The Owner may, using other contractors, correct deficiencies attributable to the Contractor, or complete unfinished work. Such action shall take place only after giving the Contractor three days written notice, and provided the Consultant approves of the proposed course of action as an appropriate remedy. The Owner may then deduct the cost of the remedial work from the amount due the Contractor.
- 29.2 The Owner may act with their sole discretion when the Contractor is unable to take action in emergency situations that potentially effect health, life or serious damage to the premises or adjacent properties, to prevent such potential loss or injury. The Owner shall inform the Contractor of the emergency work performed, particularly where it may affect the work of the Contractor.
30. Termination of Contract and Stop Work Action
- 30.1 The Owner may, owing to a certificate of the Consultant indicating that sufficient cause exists to justify such action, without prejudice to any other right or remedy and after giving the Contractor and the Contractor's surety seven days written notice, terminate the employment of the Contractor. At that time the Owner may take possession of the premises and of all materials,

00 72 13
General Conditions

tools and appliances on the premises and finish the work by whatever method the Owner may deem expedient. Cause for such action by the Owner includes:

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

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

31. Delays and Extension of Time

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

00 72 13
General Conditions

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

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

32. Payments to the Contractor

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

00 72 13
General Conditions

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

33. Payments Withheld

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

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

34. Liens

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

35. Workmanship

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

00 72 13
General Conditions

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

00 72 13
General Conditions

37. Date of Completion and Liquidated Damages

- 37.1 The Contractor may make a written request to the Owner for an extension or reduction of time, if necessary. The request shall include the reasons the Contractor believes justifies the proposed completion date. The Owner may grant the revision of the contract completion date if the Work was delayed due to conditions beyond the control and the responsibility of the Contractor. The Contractor shall not conduct unauthorized accelerated work or file delay claims to recover alleged damages for unauthorized early completion.

- 37.2 The Contractor shall vigorously pursue the completion of the Work and notify the Owner of any factors that have, may, or will affect the approved Schedule of the Work. The Contractor may be found responsible for expenses of the Owner or Consultant if the Contractor fails to make notification of project delays.

- 37.3 The Project is planned to be done in an orderly fashion which allows for an iterative submittal review process, construction administration including minor changes in the Work and some bad weather. The Contractor shall not file delay claims to recover alleged damages on work the Consultant determines has followed the expected rate of progress.

- 37.4 The Consultant shall prepare the Certificate of Substantial Completion which, when signed by the Owner and the Contractor, documents the date of Substantial Completion of the Work or a designated portion of the Work. The Owner shall not consider the issuance of a Certificate of Occupancy by an outside authority a prerequisite for Substantial Completion if the Certificate of Occupancy cannot be obtained due to factors beyond the Contractor’s control.

- 37.5 Liquidated Damages may be deducted from the sum due to the Contractor for each calendar day that the Work remains uncompleted after the completion date specified in the Contract or an approved amended completion date. The dollar amount per day shall be calculated using the Schedule of Liquidated Damages table shown below.

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

38. Dispute Resolution

38.1 Mediation

- 38.1.1 A dispute between the parties which arises under this Contract which cannot be resolved through informal negotiation, shall be submitted to a neutral mediator jointly selected by the parties.

- 38.1.2 Either party may file suit before or during mediation if the party, in good faith, deems it to be necessary to avoid losing the right to sue due to a statute of limitations. If suit is filed before good faith mediation efforts are completed, the party filing suit shall agree to stay all proceedings in the lawsuit pending completion of the mediation process, provided such stay is without prejudice.

00 72 13
General Conditions

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

38.2 Arbitration

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

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

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

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

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

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

**2023 Fair Minimum Wage Rates
 Building 2 Penobscot County
 (other than 1 or 2 family homes)**

| Occupational Title | Minimum Wage | Minimum Benefit | Total |
|--------------------------------------------------------------------------------|--------------|-----------------|----------|
| Brickmasons And Blockmasons | \$31.52 | \$5.05 | \$36.57 |
| Bulldozer Operator | \$30.00 | \$7.29 | \$37.29 |
| Carpenter | \$25.00 | \$4.75 | \$29.75 |
| Cement Masons And Concrete Finisher | \$21.00 | \$3.90 | \$24.90 |
| Construction And Maintenance Painters | \$20.00 | \$0.50 | \$20.50 |
| Construction Laborer | \$20.00 | \$1.98 | \$21.98 |
| Control And Valve Installers And Repairers - Except Mechanical Door | \$31.00 | \$9.86 | \$40.86 |
| Crane And Tower Operators | \$30.50 | \$10.69 | \$41.19 |
| Drywall And Ceiling Tile Installers | \$26.00 | \$2.12 | \$28.12 |
| Earth Drillers - Except Oil And Gas | \$28.25 | \$4.94 | \$33.19 |
| Electrical Power - Line Installer And Repairers | \$52.21 | \$29.35 | \$81.56 |
| Electricians | \$33.90 | \$0.00 | \$33.90 |
| Elevator Installers And Repairers | \$65.62 | \$43.13 | \$108.75 |
| Excavating And Loading Machine And Dragline Operators | \$25.00 | \$0.00 | \$25.00 |
| Excavator Operator | \$28.00 | \$2.40 | \$30.40 |
| Fence Erectors | \$24.00 | \$4.59 | \$28.59 |
| Floor Layers - Except Carpet/Wood/Hard Tiles | \$24.00 | \$6.32 | \$30.32 |
| Glaziers | \$45.00 | \$0.00 | \$45.00 |
| Grader/Scraper Operator | \$24.76 | \$3.96 | \$28.72 |
| Hazardous Materials Removal Workers | \$19.00 | \$0.84 | \$19.84 |
| Heating And Air Conditioning And Refrigeration Mechanics And Installers | \$29.00 | \$4.73 | \$33.73 |
| Heavy And Tractor - Trailer Truck Drivers | \$19.00 | \$0.14 | \$19.14 |
| Industrial Machinery Mechanics | \$33.43 | \$2.38 | \$35.81 |
| Insulation Worker - Mechanical | \$22.50 | \$3.63 | \$26.13 |
| Ironworker - Ornamental | \$27.22 | \$5.55 | \$32.77 |
| Light Truck Or Delivery Services Drivers | \$22.00 | \$3.17 | \$25.17 |
| Millwrights | \$34.00 | \$9.13 | \$43.13 |
| Mobile Heavy Equipment Mechanics - Except Engines | \$25.00 | \$4.32 | \$29.32 |
| Operating Engineers And Other Equipment Operators | \$26.63 | \$7.17 | \$33.80 |
| Pipelayers | \$25.50 | \$3.54 | \$29.04 |
| Plasterers And Stucco Masons | \$31.00 | \$15.28 | \$46.28 |
| Plumbers Pipe Fitters And Steamfitters | \$27.00 | \$5.94 | \$32.94 |
| Reinforcing Iron And Rebar Workers | \$22.50 | \$5.86 | \$28.36 |
| Riggers | \$28.00 | \$9.74 | \$37.74 |
| Roofers | \$23.25 | \$2.14 | \$25.39 |
| Sheet Metal Workers | \$24.88 | \$6.56 | \$31.44 |
| Structural Iron And Steel Workers | \$29.02 | \$6.72 | \$35.74 |
| Tapers | \$28.00 | \$4.18 | \$32.18 |
| Telecommunications Equipment Installers And Repairers - Except Line Installers | \$28.00 | \$8.78 | \$36.78 |
| Telecommunications Line Installers And Repairers | \$24.00 | \$4.13 | \$28.13 |
| Tile And Marble Setters | \$25.00 | \$5.05 | \$30.05 |

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

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

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

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

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

A true copy

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

Expiration Date: 12-31-2023

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00 73 46
Wage Determination Schedule

PART 1- GENERAL

1.1 Related Documents

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

1.2 Summary

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

1.3 Requirements

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

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

END OF SECTION 00 73 46

00 73 46
Wage Determination Schedule

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010010 - DIVISION 01 GENERAL REQUIREMENTS - LIMITED SCOPE

1.1 DIVISION 01 CONTENTS

- A. Contents
- B. Related Documents
- C. Summary of Work
- D. Applications for Payment
- E. Contract Modification Procedures
- F. Project Coordination
- G. Requests For Information (RFI)
- H. Cutting and Patching
- I. Reference Standards and Definitions
- J. Project Meetings
- K. Submittal Procedures
- L. Temporary Facilities
- M. Product Substitutions
- N. Project Closeout
- O. Warranties and Bonds

1.2 RELATED DOCUMENTS

- A. General provisions of Contract, including General Conditions apply to this Division and to Roofing Contractors (also known as Contractor and/or General Contractor), Subcontractors and other persons supplying materials and/or labor, entering into the Project site and/or premises, directly or indirectly.
- B. This Division is intended to provide additional details and procedures for the implementation of requirements prescribed in the Agreement.

1.3 SUMMARY OF WORK

- A. Project Description: The Project shall be known as Bathroom Renovations at Dorothea Dix Psychiatric Center .
 - 1. Upgrade existing bathrooms to be ligature resistant and upgrade finishes, sprinklers, and lighting on the first, second and third floors of Building K as the base project. Add

Alternate #1 to include upgrading single bathrooms in Building A and Building B. Add Alternate #2 to include upgrading bathrooms on the first floor of Building D.

- a. Work shall include all labor, materials, supplies, equipment, components and systems required to complete the Project as specified and reasonably inferred by the Contract Documents, without exception, and all Work or portions of the Work normally required by accepted trade practices in projects of similar type, scope and locale, without which the Work could not be completed and without which the Work would not function properly.
- B. Contractor Use of Premises: Limit use of the premises to construction activities in areas indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed. Keep all driveways and entrances serving the premises clear at all times.
1. The Owner will occupy the site and existing building during construction. Perform the Work so that interference with the Owner's operations is minimized and planned in advance.
 - a. Notify Owner at least 72 hours before any temporary interruption of utilities, safety or support systems.
 2. Provisions are to be made for the convenience, safety and comfort of staff and the public within all usable areas.
 3. Normal working hours for on-site activities shall be coordinated through Owner. Contractor may work on site after hours or weekends with Owner's approval.
 4. Keep all driveways and entrances serving the premises clear and available to the Owner, residence, staff and the public at all times. Do not use these areas for parking or material storage. Schedule deliveries to minimize on-site storage of materials and equipment.
 - a. Construction parking and material storage will be in designated areas only. Location to be determined by Owner.
 5. Smoking is prohibited anywhere on property.
 6. Do not dispose of any material on site, either by burial or by burning.
- C. Use of Existing Building: Maintain building in a weather-tight condition throughout the construction period. Take all precautions necessary to protect the building and its occupants during construction. Repair damage caused by construction operations.
1. Provide dust-proof, weather tight, secure barriers between occupied and work areas of building.
 2. Use of existing toilets, wash rooms and other facilities within the existing building will not be allowed.
 3. Use of Owner's dumpsters will not be allowed.
 4. Keep all building entrances clear and accessible at all times.
- D. Owner Occupancy Requirements: The Owner will be responsible for operation, maintenance and custodial service for occupied portions of the building.
- 1.4 APPLICATIONS FOR PAYMENT
- A. Schedule of Values: Submit the fully completed Schedule of Values in a format approved by the Architect to the Architect no later than 7 days before the date scheduled for submittal of the initial Application for Payment.
1. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment.

- B. Applications for Payment: Progress payment dates and the period of construction Work covered by each Application for Payment.
1. Submit Application for Payment to the Owner and Architect so that the Application will be received by the Architect no later than 5 days prior to the indicated date for each progress payment.
 2. Payment Application Forms: Use most up to date forms located on the “Maine Bureau of Real Estate Management” website. Provide documentation and verification as required by Owner.
 3. Transmittal: Submit three (3) signed and notarized original copies of each Application for Payment to the Architect by means ensuring receipt within 48 hours. Each copy shall be complete.
 4. Waivers of Mechanics Lien: With final Application for Payment, submit waivers of mechanics lien from every entity who is lawfully entitled to file a lien related to the Work covered by the Payment.
 - a. Immediately upon receipt of final payment, Contractor shall execute waiver of mechanics lien for the period of construction covered by the application. Deliver so that Architect receives original executed waiver no later than three (3) days after receipt of payment by Contractor.
 - b. Submit final Application for Payment with or preceded by final waivers from every entity involved with the performance of the Work covered by the application who could lawfully be entitled to a lien.
 - 1) The total amount of each entity’s final waiver of lien shall equal the contract sum for that entity including all additions and reductions thereto.
 5. Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
 - a. List of subcontractors, principal suppliers and fabricators.
 - b. Schedule of Values.
 - c. List of Contractor’s staff assignments.
 - d. Copies of building permits, if required by local jurisdiction.
 - e. Report of pre-construction meeting.
 - f. Certificates of insurance and insurance policies.
 - g. Performance and payment bonds.
 - h. Data needed to acquire Owner's insurance.
 6. Final Payment Application: This application shall reflect Certificates of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 - a. Administrative actions and submittals which must precede or coincide with submittal of the final Application for Payment include the following:
 - 1) Completion of Project closeout requirements.
 - 2) Completion of items specified for completion after Substantial Completion.
 - 3) Assurance that unsettled claims will be settled.
 - 4) Assurance that Work not complete and accepted will be completed without undue delay.
 - 5) Proof that taxes, fees and similar obligations have been paid.
 - 6) Removal of temporary facilities and services.
 - 7) Removal of surplus materials, rubbish and similar elements.

1.5 CONTRACT MODIFICATION PROCEDURES

- A. Minor Changes in the Work

1. Supplemental instructions authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time, may be issued by the Architect on AIA Document G710 "Architect's Supplemental Instructions" or other approved form.
- B. Change Order Proposal Requests
1. Owner-Initiated Proposals: The Architect will issue a detailed description of proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications. Proposal requests issued by the Architect are for information only.
 - a. Unless otherwise indicated in the proposal request, within 5 days of receipt of the proposal request, submit to the Architect for the Owner's review an itemized estimate of cost including related costs necessary to execute the proposed change.
 - 1) Include a statement indicating the effect the proposed change will have on the Contract Time.
 2. Contractor-Initiated Proposal: When latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a request for a change to the Architect.
 - a. Provide a complete description of proposed change. Indicate the reasons for the change and the effect of the change on the Work. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
 - b. Include an itemized list of products required and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Comply with requirements for product substitutions if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
- C. Construction Change Directive: When the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal Request, the Architect may issue a Construction Change Directive on AIA G714 "Construction Change Directive", instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
1. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
- D. Change Order Procedures: Upon the Owner's approval of a Change Order Proposal Request, the Architect, or the General Contractor if so required by the Architect, will issue a Change Order on AIA G701 "Change Order" for signatures of the Owner and Contractor, as provided in the Conditions of the Contract.
1. Provide minimum of three (3) original copies with documentation, as required by Architect.
- 1.6 PROJECT COORDINATION
- A. Layout: The Contractor is responsible for all layout of all Work, even if such layout is done by others. The Contractor's responsibility includes but is not necessarily limited to levels, reference points, location of access panels, openings for light fixtures, ceiling grilles, sprinkler heads and other ceiling mounted devices, etc.

- B. Coordination: The Contractor shall coordinate construction activities included under various Sections of these Specifications to assure efficient and orderly demolition and installation of each part of the Work. The Contractor shall also coordinate construction operations included under different Specifications that are dependent upon each other for proper installation, connection, inspections and approvals, accessibility and operation.
- C. Superintendent: The Contractor's superintendent shall be on site at any time Work is being done.
- D. On-Site Documents: The Contractor shall provide in a visible and accessible location on the site:
 - 1. Complete, currently updated set of Specifications and Drawings, Change Orders and other Modifications, approved Shop Drawings, Product Data, Samples and similar submittals.
 - 2. Permits and notifications required by law, regulation, etc.
 - 3. List of Owner, Architect, Contractor, superintendent, subcontractors, etc. Include name of contact person, telephone and fax numbers. Include telephone numbers for police, ambulance and fire departments.
- E. Administrative Procedures: The Contractor shall coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work.
- F. General Installation Provisions:
 - 1. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected to meet acceptable industry standards.
 - a. Should Contractor direct and require Installer to perform Work without correction of such unsatisfactory condition, Contractor shall be responsible for correction of any unacceptable Work resulting from conducting Work in such unsatisfactory condition.
 - 2. Recheck field measurements and dimensions, before starting each installation.
 - 3. Provide blocking, reinforcement, attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement including any required expansion joints or device even if not detailed or shown.
 - 4. Alteration Projects: Remove, cut, and patch Work in a manner to minimize damage, to provide smooth transitions, and to provide means of restoring Products and finishes to specified condition.
 - a. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
 - 5. During handling and installation, clean and protect construction in progress and adjoining materials in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
 - a. Control accumulation of waste materials and rubbish. Remove from work areas at least daily.
 - b. Control dust and debris from construction work at all times so it will not adversely affect the condition of adjacent areas. Abutting areas and streets will be swept and kept clean of debris.

- c. All temporary enclosures shall protect occupants, existing building and adjoining buildings, to minimize noise, dust, odors, rain, heat and cold from entering the existing buildings.
 - d. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period.
 - e. Care shall be taken to avoid fumes entering into roof top unit intakes. Pay special attention to lower level roof adjoining this project.
6. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified. RFIs must be sent for review individually (one RFI per email) to **constructadmin@harriman.com**.
- 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 - 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
- 1. Project name.
 - 2. Owner name.
 - 3. Owner's Project number.
 - 4. Name of Architect.
 - 5. Architect's Project number.
 - 6. Date.
 - 7. Name of Contractor.
 - 8. RFI number, numbered sequentially.
 - 9. RFI subject.
 - 10. Specification Section number and title and related paragraphs, as appropriate.
 - 11. Drawing number and detail references, as appropriate.
 - 12. Field dimensions and conditions, as appropriate.
 - 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 14. Contractor's signature.
 - 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.

1. Attachments shall be electronic files in PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five business days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within five days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Use software log that is part of web-based Project software. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect and Owner.
 4. RFI number including RFIs that were returned without action or withdrawn.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.
- F. On receipt of Architect's action, immediately distribute the RFI response to affected parties. Review response and notify Architect within three days if Contractor disagrees with response.
- 1.8 CUTTING AND PATCHING
- A. General: Employ skilled workmen to perform ripping, cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

- B. Operational and Safety Limitations: Do not cut, patch or secure materials and elements in a manner that would reduce their capacity to perform as intended, or would increase maintenance, or decrease operational life or safety. Obtain approval before cutting and patching operating elements or safety related systems.
- C. Visual Requirements: Do not cut and patch construction exposed on the exterior, in a manner that would, in the Architect's opinion, reduce the building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.
- D. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.
- E. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible review procedures with the original installer; comply with the original installer's recommendations.
- F. Cleaning: Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and similar items. Thoroughly clean piping, conduit and similar features before painting or finishing is applied. Restore damaged pipe covering to its original condition.

1.9 REFERENCE STANDARDS & DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract. Definitions specific to individual Specifications are included in the appropriate Specification.
 - 1. "Inspect", "inspection" when used in conjunction with the Architect's activities is the visual observation of construction to permit the Architect to render his/her professional opinion as to whether the Contractor is performing the Work in a manner indicating that, when completed, the Work will be in accordance with the Contract Documents. Such observations shall not be relied upon by any party as acceptance of the Work, nor shall they relieve any party from fulfillment of customary and contractual responsibilities and obligations.
 - 2. "Certify", "certification" when used in conjunction with the Architect's observation of the Site and the work means the Architect's opinion based on his/her observation of conditions, knowledge, information and beliefs. It is expressly understood that the Architect's certification of a condition's existence relieves no other party of any responsibility or obligation he/she has accepted by contract or custom.
 - 3. "Furnish" means supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
 - 4. "Install" describes operations at the Project site including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
 - 5. "Provide" means to furnish and install, complete and ready for the intended use.
- B. Specifications:
 - 1. References: "Refer to" references to specific Articles or Paragraphs of the Agreement or to related Specifications are provided as a convenience to the Contractor to facilitate locating of relevant requirements, procedures, or Work. The references given may not be

complete or may not be the only ones affecting the particular Specification or Paragraph wherein the reference is located.

- a. The Contractor remains responsible for locating and complying with all relevant requirements and procedures specified in the Contract Documents.
- C. Industry Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
1. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Where copies of standards are needed to perform a required construction activity, each entity is responsible for obtaining copies of each standard from the publication source.
- D. Governing Regulations and Regulations: The Contractor shall contact the authorities having jurisdiction prior to commencement of work and where necessary to obtain approvals if required.
- E. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work.

1.10 PROJECT MEETINGS

- A. Preconstruction Conference: The Contractor shall schedule a preconstruction conference and organizational meeting at the project site or other convenient location prior to commencement of construction activities. Conduct the meeting to review responsibilities and personnel assignments. The Owner will review use of site and Contract requirements.
1. Attendees: The Owner, the Contractor and his superintendent, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.
 2. Reporting: No later than 3 days after the preconstruction conference, the Contractor shall submit a report to the Owner and Architect for review. After revision by the Owner and Architect, if any, the Contractor shall distribute copies of minutes of the meeting to each party present and to other parties who should have been present, including the Owner and Architect
- B. Progress Meetings: The Contractor shall conduct progress meetings at the project site at intervals as required. Notify the Owner and Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment requests.
1. Reporting: No later than 3 days after each progress meeting date, the Contractor shall submit a report to the Architect for review. After revision by Architect, if any, the Contractor shall distribute copies of minutes of the meeting to each party present and to other parties who should have been present including the Owner.
 - a. Include a brief summary, in narrative form, of progress of Work since the previous meeting and report.
 - b. Do not remove items from reports until they have been resolved.

- C. Special Attendance at Meetings: The Owner, Owner's Designated Representative or Architect may require the attendance of a particular party or parties at any project meeting or conference.

1.11 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Submit electronic submittals by either of the following methods:
 - a. Via email as PDF electronic file to constructadmin@harriman.com .
 - 1) Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - b. Post electronic submittals as PDF electronic files directly to Architect's FTP site specifically established for Project.
 - 1) Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
- B. Architect's Action:
 - 1. General: Architect will not review submittals that do not bear Contractor's submittal stamp and will return them without action.
 - 2. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an appropriate mark to indicate status.
 - a. The Architect's marking of "Reviewed, Furnish as Corrected or similar verbiage means submittal has been reviewed for general conformance to the contract documents only and does not mean unqualified acceptance. The Contractor is fully responsible for compliance with the contract documents.
 - 3. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
 - 4. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
 - 5. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
 - 6. Submittals not required by the Contract Documents will be returned by the Architect without action.

1.12 TEMPORARY FACILITIES

- A. Submittals: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.
- B. Quality Assurance:

1. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction.
 2. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition".
- C. Temporary Utility Usage: Engage the appropriate local utility company to install temporary service or connect to existing service.
1. Use Charges: Contractor may use existing electrical service and use charges will be paid by Owner. Coordinate with Owner prior to connection.
 2. Water Service: Contractor may use existing electrical service and use charges will be paid by Owner. Coordinate with Owner prior to connection.
 3. Temporary Lighting: Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions.
 4. Temporary Telephones: Provide temporary telephone service at site for all personnel engaged in construction activities, throughout the construction period.
 5. Parking: Arrange with Owner for temporary parking areas to accommodate construction personnel and visitors.
 6. Sanitary facilities: Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities Contractor shall not use existing toilets in the facility.
 - a. Maintain daily in clean and sanitary condition.
 7. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.
 - a. Empty dumpster when full. Do not overfill or allow debris to blow around area. Keep area around dumpster free of trash, glass, nails, etc.
 - b. Burying or burning of waste materials on the site will not be permitted. Washing waste materials down sewers or into drainage waterways will not be permitted.
- D. Security and Protection Facilities Installation:
1. Temporary Fire Protection: Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations".
 - a. Locate fire extinguishers where convenient and effective for their intended purpose.
 - b. Maintain unobstructed access to fire extinguishers and access routes for fighting fires.
 2. Barricades, Warning Signs and Lights: Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform personnel and the public of the hazard being protected against. Where appropriate and needed provide lighting, including flashing red or amber lights.
 3. Security Enclosure and Lockup: Maintain locked entrances to prevent unauthorized entrance, theft and vandalism, and similar violations of security.
 - a. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with

the installation and release of material to minimize the opportunity for theft and vandalism.

4. Environmental Protection: Provide protection, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways and subsoil might be contaminated or polluted, or that other undesirable effects might result. Avoid use of tools and equipment which produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints from persons or firms near the site.

E. Materials and Equipment:

1. Submittals:
 - a. Schedule of Long Lead Time Items: The General Contractor shall provide the Architect with a schedule of all long lead items for review and approval prior to ordering. Once approved, the General Contractor shall pre-order items in a timely manner as not to delay the progress of the Work.
2. Quality Assurance:
 - a. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
 - b. Compatibility of Options: When the General Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
 - 1) Provide interchangeable components of the same manufacture for components being replaced.
3. Product Delivery, Storage, and Handling: Deliver, store and handle products in accordance with the manufacturer's written recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
 - a. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
 - b. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
 - c. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that quantities are correct and that products are undamaged and properly protected.
 - d. Inspect products for damage when removed from storage area. Repair or replace damaged products before installation. Manufacturer's representative shall certify all repairs as meeting manufacturer's original standards.
4. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.
 - a. Provide products complete with all accessories, trim, finish, and details needed for a complete installation and for the intended use and effect.
 - b. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects, except where otherwise specified.
5. Product Selection Procedures: Product selection is governed by the Contract Documents and governing regulations, not by previous experience. Procedures governing product selection include the following:

- a. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
- b. Semiproprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.
 - 1) “Or Equal” Specification Requirements: Where products or manufacturers are specified by name, accompanied by the term “or equal,” or “or approved equal” comply with the Contract Document provisions concerning “substitutions” or obtain approval for use of an unnamed product.
- c. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
- d. Performance Specification Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
 - 1) Manufacturer's written recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
- e. Compliance with Standards, Codes and Regulations: Where the Specifications only requires compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.
- 6. Installation of Products: Comply with manufacturer's written instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
 - a. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

1.13 PRODUCT SUBSTITUTIONS

- A. “Substitutions” are requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the General Contractor after the Notice to Proceed. The following are not considered substitutions:
 - 1. Substitutions requested by Bidders during the bidding period, and accepted prior to the Notice to Proceed, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
 - 2. Revisions to Contract Documents requested by the Owner or Architect.
 - 3. Specified options of products and construction methods included in Contract Documents.
 - 4. The General Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.
- B. Substitution Request Submittal: Requests for substitution will be considered if, in the opinion of the Architect, such substitution will be of benefit to the Owner.
 - 1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
 - a. Attach completed “Contractor/General Contractor’s Substitutions Checklist” to each request for substitution. Forms to be obtained from Architect.

2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
 - a. Product Data, including drawings, specification sheets, and descriptions of products, fabrication and installation procedures.
 - b. Samples, where applicable.
 - c. Product specifications and samples of the specified products for comparison.
 - d. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
 - e. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
 - f. A statement indicating the substitution's effect on the General Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
 - g. Cost information, including additional cost or savings in other parts of the Work resulting from the proposed substitution and a proposal of the net change, if any in the Contract Sum.
 - h. Certification by the General Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the General Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
3. Architect's Action: Within one week of receipt of the request for substitution, the Architect may request additional information or documentation necessary for evaluation of the request. Within 1 weeks of receipt of the request, or one week of receipt of the additional information or documentation, which ever is later, the Architect will notify the General Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order.

C. Conditions: The General Contractor's substitution request will be received and considered by the Architect when one or more of the following conditions are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.

1. Extensive revisions to Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of Contract Documents.
3. The request is timely, fully documented and properly submitted.
4. The request is directly related to an "or equal" clause or similar language in the Contract Documents.
5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
7. A substantial advantage is offered the Owner, in terms of cost savings, time savings, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear.

8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the General Contractor certifies that the substitution will overcome the incompatibility.
 9. The specified product or method of construction cannot be coordinated with other materials, and where the General Contractor certifies that the proposed substitution can be coordinated.
 10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the General Contractor certifies that the proposed substitution provide the required warranty.
- D. The General Contractor's submittal and Architect's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

1.14 PROJECT CLOSEOUT

A. Completion:

1. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect's review.
2. Inspection Procedures: On receipt of a request for inspection, the Architect and Owner will either proceed with inspection or advise the General Contractor of unfilled requirements. The Architect will prepare following inspection, or advise the General Contractor of construction that must be completed or corrected before the certificate will be issued.
3. **Contractor shall be charged liquidated damages of \$500/day for every day past final completion date specified in Notice to Contractors.**

B. Closeout Procedure:

1. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
 - a. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include final waivers of lien, and certificates of insurance for products and completed operations where required.
 - b. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 - c. Submit a certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and the list has been endorsed and dated by the Architect.
 - d. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, and similar final record information.
 - e. Submit consent of surety to final payment on AIA G707 "Consent of Surety to Final Payment".

C. Record Document Submittals:

1. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Show the actual installation where the installation varies substantially from the Work as originally shown. Mark drawings to show conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular

attention to concealed elements that would be difficult to measure and record at a later date.

- a. Mark record sets with red non-erasable pencil and notes, details or sketches which are affected.
 - b. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
 - c. Note related Change Order numbers where applicable.
2. Miscellaneous Record Submittals: Refer to other Specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner's records.
 3. Maintenance Manuals: Organize maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder.
- D. Final Cleaning: Employ experienced workers for final cleaning. Clean roof surface to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
 - a. Remove labels that are not permanent labels.
 - b. Wipe surfaces of mechanical equipment.
 - c. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances.
- E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

1.15 WARRANTIES AND BONDS

- A. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the General Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the General Contractor.
- B. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- C. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- D. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The General Contractor is responsible for the cost of replacing or rebuilding

defective Work regardless of whether the Owner has benefitted from use of the Work through a portion of its anticipated useful service life.

- E. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.
 - 1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- F. Owner's Right of Refusal: The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.
- G. Commencement Date of Warranties: Date of Certificate of Substantial Completion designates a commencement date for warranties.
- H. Form of Submittal: At Final Completion compile two copies of each required warranty and bond properly executed by the General Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Refer to individual Specifications for specific content requirements, and particular requirements for submittal of special warranties.
 - 2. Verify that documents are in proper form, contain full information, and are notarized. Co-execute submittals when required.
 - 3. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

END OF SECTION 010010

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SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.
 - 2. Hold pricing for 60 days from date of bid to allow Owner time for project accounting. Alternates not accepted before contract signing may be added by Change Order later.

1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A Schedule of Alternates is included at the end of this Section.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate No.1 – Toilet Room Renovations for Building A and Building B: Upgrade existing bathrooms to be ligature resistant and upgrade finishes, sprinklers and lighting.
- B. Alternate No. 2 – Toilet Room Renovations for Building D First Floor: Upgrade existing bathrooms to be ligature resistant and upgrade finishes, sprinklers and lighting.

END OF SECTION 012300

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOUCMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Wood blocking and nailers.
 - 2. Sheathing.
 - 3. Plywood backing panels.
- B. Related Sections include the following:
 - 1. Division 09 Section "Gypsum Board Assemblies" for metal framing supporting sheathing.

1.3 DEFINITIONS

- A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise indicated.
- B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.
- C. Lumber grading agencies, and the abbreviations used to reference them, include the following:
 - 1. NELMA - Northeastern Lumber Manufacturers Association.
 - 2. NLGA - National Lumber Grades Authority.

1.4 SUBMITTALS

- A. General: Submit in accordance with Division 01.
- B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials, both before and after exposure to elevated temperatures when tested according to ASTM D 5516 and ASTM D 5664.
 - 2. For fire-retardant treatments specified to be High-Temperature (HT) type, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
 - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

- C. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the American Lumber Standards Committee Board of Review.
- D. Evaluation Reports: For the following, showing compliance with ICC-ES:
 - 1. Fire-retardant-treated wood and plywood.
 - 2. Power-driven fasteners.
 - 3. Powder-actuated fasteners.

1.5 QUALITY ASSURANCE

- A. Source Limitations for Fire-Retardant-Treated Wood: Obtain each type of fire-retardant-treated wood product through one source from a single producer for both treatment and fire-retardant formulation.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack plywood and other panels flat. Place spacers between each bundle of lumber, plywood, and panel products to provide air circulation. Provide for air circulation around stacks and under coverings.
 - 1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
 - 2. Products: Subject to compliance with requirements, provide one of the products specified.
- B. Substitutions: Materials shall be as specified herein, except, consideration shall be given to other products that meet or exceed those specified if requested 5 business days prior to the date of bid in accordance with Section 01600 "Product Requirements."

2.2 WOOD AND PANEL PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 3. Provide dressed lumber, S4S, unless otherwise indicated.

4. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
5. Fire retardant treated.

B. Wood Structural Panels:

1. Plywood: DOC PS 1.
2. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
3. Factory mark panels according to indicated standard.
4. Fire retardant treated.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWWA C20 (lumber) and AWWA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5664, for lumber and ASTM D 5516, for plywood.
 2. Use treatment that does not promote corrosion of metal fasteners.
 3. Use Interior Type A High Temperature (HT), unless otherwise indicated.
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Application: Treat all rough carpentry and plywood, unless otherwise indicated.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide fire retardant treated lumber for support or attachment of other construction, including the following:
1. Blocking.
 2. Nailers.
- B. For items of dimension lumber size, provide Construction, Stud, or No. 2 or better grade lumber with 19 percent maximum moisture content and the following species:
1. Spruce-pine-fir; NLGA or NeLMA.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and the following species and grades:
1. Spruce-pine-fir, Standard or 3 Common grade; NeLMA or NLGA.
- D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.5 SHEATHING

- A. Plywood Sheathing, Fire-Retardant Rated: Exposure 1 sheathing. Panels shall be non-corrosive, fire retardant panels, Class A.
 - 1. Nominal Thickness: Not less than 1/2 inch.
 - 2. Grade: C-D.
 - 3. Species: Fir.
 - 4. Products:
 - a. Chemical Specialties, Inc.; D-Blaze Fire Retardant Pressure Treated Plywood.
 - b. Hoover Treated Wood Products, Inc.; Exterior Fire-X Plywood.

2.6 PLYWOOD BACKING PANELS

- A. Telephone, Data, and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch nominal thickness.

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Screws for Fastening Plywood Sheathing to Metal Framing: Hilti Kwik-Flex or Elco Dril-Flex; 10-24 x 1-1/4" wafer head #3.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- C. Do not use panel materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- D. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

- E. Securely attach rough carpentry and panel work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 - 3. National Evaluation Report No. NER-272 for pneumatic or mechanical driven staples, P-Nails, and allied fasteners.
- F. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Install wood blocking and nailers to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, millwork, casework, furnishings, building specialties, countertop supports, and miscellaneous items and fabrications, Owner furnished items, equipment supports, or similar construction. Provide 3/4-inch thick plywood covering a minimum of 32 inches square for toilet accessories. Provide 1-1/2 inch thick blocking minimum, for grab bars. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
 - 1. Install blocking for grab bars and handrail supports to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.
 - 2. Provide concealed wood blocking behind gypsum wallboard where door stops are to be installed.
 - 3. Provide 1-1/2 inch thick blocking minimum, for accessories mounted in patient areas including patient rooms, patient toilet rooms, patient toilet/shower rooms, seclusion room, day room, family room, quiet and nurses station.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 WOOD PANEL INSTALLATION

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
- D. Fastening Methods: Fasten panels as indicated below:
 - 1. Sheathing:
 - a. Screw to metal framing at 12 inches o.c. at perimeter and field of board.
 - b. Space panels 1/8 inch apart at edges and ends.
 - 2. Plywood Backing Panels: Screw to supports.

END OF SECTION 061000

SECTION 064000 - ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes, but is not limited to, the following:
 1. Plastic-laminate cabinets.
 2. Solid-surfacing-material countertops.

1.3 DEFINITIONS

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items, unless concealed within other construction before woodwork installation.
- B. Exposed Surfaces of Casework: Surfaces visible when doors and drawers are closed, including visible surfaces in open cabinets or behind glass doors.
- C. Semiexposed Surfaces of Casework: Surfaces behind opaque doors or drawer fronts, including interior faces of doors and interiors and sides of drawers. Bottoms of wall cabinets are defined as "semiexposed."
- D. Concealed Surfaces of Casework: Surfaces not usually visible after installation, including sleepers, web frames, dust panels, bottoms of drawers, and ends of cabinets installed directly against and completely concealed by walls or other cabinets. Tops of wall cabinets and tall cabinets are defined as "concealed."

1.4 SUBMITTALS

- A. General: Submit in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: For each type of product indicated, including cabinet hardware and accessories, and finishing materials and processes.
- C. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
 1. Show details full size.
 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, and other items installed in architectural woodwork.
- D. Product Certificates: Signed by manufacturers of woodwork certifying that products furnished and construction provided comply with requirements.

- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced Installer who has completed architectural woodwork similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Fabricator Qualifications: A firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production and installation of interior architectural woodwork.
- D. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Standards, First Edition" for grades of interior architectural woodwork, construction, finishes, and other requirements.
 - 1. The Contract Documents contain selections chosen from options in AWI's Standards as well as additional requirements beyond those of AWI's Standard. Comply with such selections and requirements in addition to AWI's Standard.
- E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install woodwork until wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by accurate field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.

1.8 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.
- B. Coordinate locations and sizes of plumbing fixtures that will penetrate countertops.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Products: Subject to compliance with requirements, provide one of the products specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
- B. Substitutions: Materials shall be as specified herein, except, consideration shall be given to other products that meet or exceed those specified if requested 5 business days prior to the date of bid in accordance with Section 01600 "Product Requirements."

2.2 MATERIALS

- A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- B. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard, MDF: ANSI A208.2, Grade MD-21, 48 lb. density.
 - a. Provide moisture-resistant MDF within 2-feet of sinks.
 - 1) Moisture Resistant: ASTM D 1037, 6-cycle accelerated aging test.
 - a) Product: SierraPine Composite Solutions; Medex.
 - 3. Particleboard: ANSI A208.1, Grade M-2.
- C. Thermoset Decorative Panels (Melamine): Particleboard or medium-density fiberboard, finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1, fused to core using average pressure of 320 psi and average temperature of 320 deg F.
 - 1. Provide PVC edge banding complying with LMA EDG-1 on components with exposed or semiexposed edges.
- D. High-Pressure Decorative Laminate, PL1 & PL2: NEMA LD 3, grades as indicated, or if not indicated, as required by woodwork quality standard.
 - 1. Manufacturer: Pionite.
 - 2. Colors, Patterns, and Finishes: As indicated on Materials Legend.
- E. Edgebanding for Plastic Laminate: Rigid PVC extrusions, through color with satin finish, 1 mm and 3 mm thick, with radiused edges. Hot melt adhesive application.

- F. Solid-Surfacing Material, SS1: Homogeneous solid sheets of filled plastic resin complying with material and performance requirements in ANSI Z124.3, for Type 5 or Type 6, without a precoated finish.
 - 1. Product: Corian; DuPont Polymers.
 - 2. Color, Patterns, and Finishes: As indicated in Materials Legend.

2.3 CABINET ACCESSORY MATERIALS

- A. Counter Bracket Supports: Fabricated of 6063 T-6, T-shaped extruded aluminum; MIG welded along 45 degree miters and along back; pre-punched for 1/4-inch fasteners; provide rubber grommet in 7/8-inch hole; powder coated finish.
 - 1. Size: Varies as required for condition; coordinate with Drawings.
 - 2. Mounting Style: Concealed mounting.
 - 3. Product: Rakks, Rangine Corp., Millis, MA.
- B. Steel Tube Stiffeners: Structural steel tube, sized to fit within walls of millwork. Provided welded base plate to be concealed within walls of millwork. Expansion anchor to concrete slab with not less than three expansion anchors.

2.4 INSTALLATION MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.
- B. Exposed Fasteners: All exposed fasteners, including for hardware, shall have pinned Torx-Plus heads.
- C. Screws: Select material, type, size, and finish required for each use and substrate. Comply with ASME B 18.6.1 for applicable requirements.
 - 1. For metal framing supports, provide screw as recommended by metal-framing manufacturer.
- D. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
- E. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.5 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade indicated and any additional requirements of this Section. When quality grade is not indicated, provide Custom quality grade.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

- C. Complete fabrication, including assembly, and hardware application, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- D. Shop cut openings, to maximum extent possible, to receive hardware, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of water-resistant varnish.

2.6 PLASTIC-LAMINATE CABINETS

- A. Quality Standard: Comply with AWI's Standards, Section 10 - Casework and additional specified requirements for laminate cabinets.
- B. Grade: Custom.
- C. AWI Type of Cabinet Construction: Flush overlay.
- D. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
 - 1. Horizontal Surfaces Other Than Tops: HGL.
 - 2. Vertical Surfaces: VGS.
 - 3. Edges: PVC tape, 0.018-inch (0.460-mm) minimum thickness, matching laminate in color, pattern, and finish.
- E. Materials for Semiexposed Surfaces: Provide surface materials indicated below:
 - 1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.
- F. Edgebanding: Color to match surfacing material. Finished edgebanding shall be uniform in color and sheen.
 - 1. Exposed and Semi-Exposed Shelving: 3 mm PVC applied to front edge. 1 mm PVC applied to back edge and both ends.
 - 2. Doors and Drawer Fronts: 3 mm PVC applied to perimeter, matching face laminate.
 - 3. Drawer Bodies: 1 mm PVC applied to all edges, semi-exposed and concealed locations (top, back and bottom edges).
 - 4. Cabinet Bodies: 1 mm PVC applied to all exposed and semi-exposed edges, matching face laminate.
 - 5. Dividers: 1 mm PVC.
- G. Colors, Patterns, and Finishes: As indicated in Interior Materials Legend.

2.7 SOLID-SURFACING-MATERIAL COUNTERTOPS

- A. Quality Standard: Comply with AWI's Standards Section 11 - Countertops requirements for solid surfacing countertops.
- B. Grade: Custom.
- C. Solid-Surfacing-Material Thickness: 3/4 inch.
- D. Colors, Patterns, and Finishes: As indicated in Materials Legend.
- E. Fabricate tops in one piece with shop-applied backsplashes and edges, unless otherwise indicated. Comply with solid-surfacing-material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing. Provide scribe strip along back edge of back splash. Provide built-up nosing with concealed drip groove.
- F. Drill holes in countertops for sinks and plumbing fittings in shop.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI's Standard for the same grade specified in Part 2 of this Section for type of woodwork involved.
- B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
- C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- E. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 3. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.

4. Install countertop brackets specified in Part 2. Painting of bracket specified in Division 09 Section "Painting."
 5. Provide cutouts for plumbing fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal surfaces of cutout edges.
 6. Caulk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."
- F. Complete the finishing work specified in this Section to extent not completed at shop or before installation of woodwork. Fill nail holes with matching filler where exposed. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats were applied in shop.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces.

3.4 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to fabricator and Installer that ensures that woodwork is without damage or deterioration at time of Substantial Completion.

END OF SECTION 064000

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SECTION 064500 - SOLID SURFACE SHOWER PANS AND SURROUNDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Shower pans.
 - 2. Solid surfacing shower surrounds.
- B. Related Sections include the following:
 - 1. Division 22 Sections for plumbing fittings.

1.3 SUBMITTALS

- A. Product Data: For each factory-fabricated product. Include material descriptions, dimensions of individual components and profiles, textures, and colors. Include installation instructions.
- B. Shop Drawings: Show materials, finishes, and profiles, methods of joining components, and locations for plumbing fittings.

1.4 QUALITY ASSURANCE

- A. Installer of Solid Surfacing Surrounds and Shower Pans: A qualified firm that is authorized by manufacturer to install manufacturer's product.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store solid surfacing shower surrounds and shower pans in original undamaged packages. Handle materials to prevent damage to surfaces.

1.6 WARRANTY

- A. Warranty: Manufacturer's standard written warranty, signed by manufacturer agreeing to replace shower pans and shower surrounds that fail in materials and workmanship within specified warranty period. Products shall be warranted against cracks, breakage, and leakage.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Products: Subject to compliance with requirements, provide one of the products specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
- B. Substitutions: Materials shall be as specified herein, except, consideration shall be given to other products that meet or exceed those specified if requested 5 business days prior to the date of bid in accordance with Section 01600 "Product Requirements."

2.2 SOLID SURFACING SHOWER PANS AND SHOWER SURROUNDS

- A. Product: Tower Industries, Inc.; Meridian Solid Surface Shower Base and Surround.
 - 1. Contact: Catamount Commercial Construction; Mark Verville, 617-775-5756; mark@catamountcc.com.
- B. Shower Pans: Shall be fabricated from solid cast polyester/acrylic blend resin. Units shall have coved side walls, a 3 inch panel platform with a 5 degree slope; a non-skid pebble-textured floor directing water to drain at a minimum 0.6 degree slope of 1/8-inch per foot. Shower pans shall be a minimum of 9/16-inch thick at the thinnest point of the drain orifice. Pans shall comply with ANSI Z124.2 certification and shall have a non-slip co-efficient rating of 0.30 or greater in accordance with ASTM F 462.
 - 1. ADA Units (C126A, C133A): Custom pebble textured shower base with tapered floor and custom perimeter stepped water dam configuration to receive wall shower surround configuration indicated; integrated independent barrier-free shower threshold at shower entry opening; size as indicated; coordinate drain location. Field verify each location prior to ordering.
 - 2. ADA Unit (C160A): Stock size with integral textured shower base floor and handicap threshold for alcove installation; 39 inch by 39 inch size.
 - 3. Color: Granite Patterned, color as selected by Architect from manufacturer's standard colors.
- C. Solid Surface Material for Shower Surrounds: Homogeneous, thermoset polymer compound comprised of acrylic and polyester components filled with aluminum trihydrate. Materials shall be non-porous and homogenous, with uniform color and pattern throughout the entire thickness. Material shall be 100 percent repairable.
- D. Shower Surrounds: Manufactured wall panels, 1/4-inch thick, by full height by full width without joints, sized to fit shower base.
 - 1. Color: Granite Patterned, color as selected by Architect from manufacturers standard colors.
- E. Shower Surround Accessories:
 - 1. Provide manufacturer's installation kit consisting of silicone adhesive, color matched silicone caulk, adhesive tape and all components necessary for a complete installation.
 - 2. Inside Vertical Corners Cove Trim: Meridian Solid Surface CornerSeal Model #MSTM00CS.

- a. Corner Trim Adhesive: CornerSealant Solid Surface Molding Adhesive.
 - 1) Security Shower Requirements (C126A, C133A): Corner adhesive shall permanently adhere corner trim into position. If possible, chemically weld one side of trim to wall panel to fuse trim to one side of joint. Trim shall resist patient attempt to remove corner trim, that could be used to cause injury. Review requirement with Architect.
- F. Thin Set Mortar for Setting Shower Pan: ANSI A118.4, prepackaged premium dry-mortar mix combined with acrylic resin liquid-latex additive.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Stud rough opening shall provide 1/8-inch clearance from all sides of shower pan.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Prep substrates and surfaces to ensure proper adhesion of adhesives.

3.3 INSTALLATION OF SOLID SURFACING SHOWER PANS AND SHOWER SURROUNDS

- A. Installation of Shower Pans: Install shower pans plumb and level in accordance with manufacturer's installation instructions. Coordinate with plumbing installation requirements in Division 22 sections.
 - 1. Shower pan shall be set with thin set mortar in accordance with manufacturer's installation instructions. Base shall be set level and fully supported by thin set mortar.
- B. Installation of Shower Surrounds: Install surrounds plumb and level in accordance with manufacturer's installation instructions. Adhere to walls. Support panels in intimate contact with the substrate until adhesive cures. Completed installation shall be watertight at surround inside vertical corners and intersection to shower pan. Seal top joint where surround intersects ceiling.
- C. Surround Vertical Corner Cove Trim Installation: Adhere inside corner cove trim with specified corner adhesive, forming a permanent watertight joint from ceiling panel to shower pan. Installation shall be permanent and non-removable.
- D. Exposed edges and ends of panels and trim shall be finished to match panel face.
- E. At exposed caulked joints, provide uniform small bead of sealant. Do not install excessively large, oversized sealant joints. Remove excess and smears with alcohol per manufacturer's instructions.

END OF SECTION 064500

SECTION 085115 - ALUMINUM IMPACT WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes aluminum impacts windows with integral blinds applied to interior face of existing aluminum storefront.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review, discuss, and coordinate the interrelationship of aluminum windows with other exterior wall components.
 - 2. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, glazing and fabrication methods, dimensions of individual components and profiles, hardware, and finishes for aluminum windows.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
 - 1. Show attachment requirements to existing storefront.
- C. Design Calculations for Window Attachment: Submit designed and engineered attachment requirements of the impact window system to meet the window human impact design loads by a qualified professional engineer responsible for their preparation. Submittal shall be signed and stamped by engineer.
- D. Product Schedule: For aluminum impact windows. Use same designations indicated on Drawings.

1.5 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For aluminum impact window, for tests performed by a qualified testing agency.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A manufacturer capable of fabricating aluminum impact windows that meet or exceed performance requirements indicated and of documenting this performance by test reports, and calculations.
- B. Installer Qualifications: An installer acceptable to aluminum impact window manufacturer for installation of units required for this Project.
- C. Submit design calculation prepared by a professional structural engineer for attachment and connection requirements of the impact window system to the existing aluminum storefront to meet the human impact design loads of the window system.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Simulated Human Impact Tests:
 - 1. Conduct tests in general accordance with AAMA draft standard 501.8 "Standard Test Method for Determination of Resistance to Human Impact of Window Systems Intended for Use in Psychiatric Applications", to simulate a purposeful shoulder impact from the interior, on representative test unit, reflecting the full range of energy absorption variables on the project. Test units shall be representative of windows on the project in details of frame connections, glazing, and anchorage.
 - 2. Test units shall be a minimum of 4'-0" x 6'-0" or the largest size in which compliance is sought, whichever is greatest.
 - 3. Interior of each test unit shall be impacted as per the referenced AAMA standard with a lead shot impactor delineated in the standard. The impactor shall be swung from a vertical height sufficient to generate a 2000 ft-lb of impact, directed at center-of-glass, midpoint between locks, and lower jamb locking point, one each respectively.
 - 4. At the conclusion of impact testing, the window shall remain intact as a barrier to egress.
 - 5. Testing: Where manufacturer's standard window units comply with requirements and have been tested in accordance with specified AAMA tests, provide such tests. Submit copy of the test report signed by the independent laboratory.
 - a. Test reports more than four years old will not be accepted.

2.2 MANUFACTURERS

- A. Provide a complete, integrated assembly, including security glazing, blinds and accessories.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Series S6316 human impact window as manufactured by Graham Architectural Products, York, PA or Architect approved equal.
- B. Source Limitations: Obtain aluminum windows and blinds from single source from single manufacturer.
- C. Substitutions: Materials shall be as specified herein, except, consideration shall be given to other products that meet or exceed those specified if requested 5 business days prior to the date of bid in accordance with Section 01600 "Product Requirements."

2.3 PERFORMANCE REQUIREMENTS

A. Simulated Human Impact Tests:

1. Conduct tests in general accordance with AAMA draft standard 501.8 "Standard Test Method for Determination of Resistance to Human Impact of Window Systems Intended for Use in Psychiatric Applications", to simulate a purposeful shoulder impact from the interior, on representative test unit, reflecting the full range of energy absorption variables on the project. Test units shall be representative of windows on the project in details of frame connections, glazing, and anchorage.
2. Test units shall be a minimum of 4'-0" x 6'-0" or the largest size in which compliance is sought, whichever is greatest.
3. Interior of each test unit shall be impacted as per the referenced AAMA standard with a lead shot impactor delineated in the standard. The impactor shall be swung from a vertical height sufficient to generate a 2000 ft-lb of impact, directed at center-of-glass, midpoint between locks, and lower jamb locking point, one each respectively.
4. At the conclusion of impact testing, the window shall remain intact as a barrier to egress.
5. Testing: Where manufacturer's standard window units comply with requirements and have been tested in accordance with specified AAMA tests, provide such tests. Submit copy of the test report signed by the independent laboratory.
 - a. Test reports more than four years old will not be accepted.

2.4 ALUMINUM WINDOWS

A. Operating Types: Provide the following operating types in locations indicated on Drawings:

1. Casement: Project in, with custodial operation.
2. Frame Depth: 2-7/16 inches.

B. Aluminum Extrusions: Alloy and temper recommended by window manufacturer for strength, corrosion resistance and application of required finish, but not less than 22,000 psi ultimate tensile strength, a yield of 16,000 psi. Comply with ASTM B 221.

C. Glazing: 1/2-inch thick clear polycarbonate with mar resistant surfaces.

D. Glazing System: Manufacturer's standard bead glazed utilizing bulb seal and high bonding glazing tape system that complies with impact requirements.

E. Window Hardware:

1. Hardware shall be custodial or supervisory-operated and include:
 - a. Multi-point lock bars with "capture" keyed actuators and keepers.
 - b. 4-bar casement hinges.
 - c. GEM Tubular key lock.
 - d. Sash snubbers

F. Fasteners: Stainless steel, and compatible with window members, trim, hardware, anchors, and other components.

1. Exposed Fasteners: Do not use exposed fasteners.

2.5 ACCESSORIES

- A. Horizontal Louver Blinds: Provide manufacturer's standard commercial quality, removable, horizontal louver blinds with 1-inch aluminum slats and polyester fiber cords that are operated by hardware located on inside face of sash.
 - 1. Operation: Tilt only, removable key operation.
 - a. Tilting mechanism driven by a cable attachment with a universal clutch to minimize cable or blind damage.
 - b. Provide 6 keys for tilt operation.
 - 2. Color: As selected by Architect from manufacturer's standard range.

2.6 FABRICATION

- A. Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.
- B. Glaze aluminum windows in the factory.
- C. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation.

2.7 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 611.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

- B. Verify opening dimensions and operational clearances.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.

3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and closure.
- B. Clean exposed surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
 - 1. Keep protective films and coverings in place until final cleaning.
- C. Remove and replace glazing that has been chipped, scratched, cracked, abraded, or damaged during construction period.
- D. Protect window surfaces from contact with contaminating substances resulting from construction operations. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written instructions.

END OF SECTION 085115

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SECTION 092950 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Interior gypsum wallboard.
 - 2. Non-load-bearing steel framing.
 - 3. Interior ceiling systems.
 - 4. Acoustical insulation in metal-framed assemblies.
 - 5. Acoustical sealants.
 - 6. Firestopping at wall and partition perimeters of fire-rated construction.
 - 7. Sealing at wall and partition perimeters of smoke wall construction.
- B. Related Sections include the following:
 - 1. Division 06 Section "Rough Carpentry" for concealed wood blocking in gypsum board assembly walls and plywood wall sheathing behind gypsum board.
 - 2. Division 07 Section "Thermal Insulation" for thermal insulation installed in gypsum board assemblies.
 - 3. Division 07 Section "Joint Sealants" for sealants not covered by work of this Section.
 - 4. Division 09 Section "Painting" for coordination/inspection requirements with painting contractor and primers applied to gypsum board surfaces.

1.3 DEFINITIONS

- A. Gypsum Board Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 SUBMITTALS

- A. General: Submit in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: For each type of product indicated. Include documentation for the following:
- C. Shop Drawings: Show locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other units of Work.
 - 1. Submit marked up floor plans with location of all control joints in gypsum board walls and ceilings.
 - 2. Firestopping: For each joint condition where fire-rated walls and partitions interface other walls, floors, structural members or other building structure, provide UL firestop system description and drawing. Show each kind of construction condition and relationships to adjoining construction. Indicate which firestop materials will be used where and thickness for different hourly ratings. Include UL firestop design designation that evidences compliance with requirements for each condition.

1.5 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Fire-Resistance-Rated Assemblies: Indicated by design designations from UL's "Fire Resistance Directory," GA-600, "Fire Resistance Design Manual," or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Deflection Firestop Track: Top runner indicated in fire-resistance-rated assemblies shall be labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Source Limitations for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single source from a single manufacturer.
- C. Source Limitations for Panel Products: Obtain each type of gypsum board and other panel products from a single source from a single manufacturer.
- D. Source Limitations for Finishing Materials: Obtain finishing materials from either manufacturer supplying gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.
- E. Gypsum Board Finish Mockups: Before finishing gypsum board assemblies, install mockups using room designated by Architect to demonstrate aesthetic effects and qualities of materials and execution.
 - 1. Install mockups for surfaces indicated to receive nontextured paint finishes.
 - 2. Simulate finished lighting conditions for review of mockups.
 - 3. Mockup will be painted under Division 09 Section "Painting" to provide finished condition for viewing.
 - 4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.
- C. Stack gypsum panels flat on leveled supports off floor or slab to prevent sagging.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.
- D. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F. Do not exceed 95 deg F when using temporary heat sources.
- E. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.
- 1.8 COORDINATION
- A. Coordinate installation of framing tracks needing to be attached to structural components prior to application of spray-applied fire-resistive materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.
 2. Products: Subject to compliance with requirements, provide one of the products specified.
- B. Substitutions: Materials shall be as specified herein, except, consideration shall be given to other products that meet or exceed those specified if requested 5 business days prior to the date of bid in accordance with Section 01600 "Product Requirements."

2.2 NON-LOAD-BEARING STEEL FRAMING, GENERAL

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal, unless otherwise indicated.
 2. Protective Coating: ASTM A 653, G40, hot-dip galvanized, unless otherwise indicated.

2.3 STEEL CEILING AND SOFFIT FRAMING

- A. Manufacturers:
1. Clark Dietrich Building Systems.
 2. Super Stud Building Products, Inc.
- B. Ceiling Joists: Cold-rolled, commercial-steel sheet with a base metal thickness of 0.0312 inch (20 gage), a minimum 1/2-inch-wide flange, with ASTM A 653/A 653M, G40, hot-dip galvanized zinc coating.
1. Depth: 3-5/8 inches, unless indicated otherwise.
- C. Furring Channels (Furring Members): Commercial-steel sheet with ASTM A 653/A 653M, G40, hot-dip galvanized zinc coating.
1. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep; where indicated.

- a. Minimum Base Metal Thickness: 0.0312 inch (20 gage).

2.4 STEEL PARTITION AND SOFFIT FRAMING

- A. Manufacturers:
 - 1. Clark Dietrich Building Systems.
 - 2. Super Stud Building Products, Inc.
- B. Steel Studs and Runners, Gauge Equivalent Drywall Framing: ASTM C 645.
 - 1. Minimum Base Metal Thickness: 0.0312 inch (20 gage) minimum, except as indicated otherwise.
 - a. Provide minimum 0.070 inch (14 gage) thickness for framing receiving bullet-resistant steel panels.
 - 2. Depth: As indicated.
 - 3. Maximum Allowable Deflection: Increase metal thickness where required to meet the following:
 - a. Maximum Allowable Deflection for Drywall Assemblies: $L/240$ calculated using a 5 pound per square uniform load perpendicular to studs and based on stud properties alone.
- C. Deep-Leg Deflection Track: ASTM C 645 top runner with flanges to allow for 3/4-inch deflection at floors.
- D. Firestop Deflection Track: Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs. Provide deflection track with flanges to allow for 3/4-inch deflection at floors.
 - 1. Product: Fire Trak Corp.; Fire Trak attached to studs with Fire Trak Slip Clip.
- E. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.
 - 1. Minimum Base Metal Thickness: 0.0598 inch (16 gage), unless indicated otherwise.
- F. Cold-Rolled Channel Bridging: 0.0538-inch (16 gage) minimum bare steel thickness, with minimum 1/2-inch- wide flange.
 - 1. Depth: 1-1/2 inches.
 - 2. Clip Angle: 1-1/2 by 1-1/2 inch, 0.068-inch- thick, galvanized steel.
- G. Furring Brackets: Serrated-arm type, adjustable, fabricated from corrosion-resistant steel sheet complying with ASTM C 645, 20 gauge, .0329 inch, designed for screw attachment to steel studs and steel rigid furring channels used for furring.
- H. Deflection Brackets:
 - 1. Construction: Slotted galvanized steel angle with step bushing to prevent over tightening of fasteners.
 - 2. Vertical Deflection: 1-1/2 inch total travel.
 - 3. Product: VertiClip; Signature Industries, (919) 844-0789.
 - a. Series: SL, SDL, SLB, and SLS as required by attachment condition.
- I. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing members to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

2.5 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- B. Manufacturers:
 - 1. G-P Gypsum Corporation.
 - 2. National Gypsum Company.
 - 3. United States Gypsum Company.

2.6 INTERIOR GYPSUM WALLBOARD

- A. General: Complying with ASTM C 36/C 36M or ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.
- B. Regular Type, GPDW:
 - 1. Thickness: 1/2 inch, unless otherwise indicated.
 - 2. Long Edges: Tapered.
 - 3. Face Sheets: 100 percent post-consumer recycled content.
- C. Type X, GPDW:
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered.
 - 3. Face Sheets: 100 percent post-consumer recycled content.
 - 4. Location: All locations, except as otherwise noted.
- D. Moisture- and Mold-Resistant Type, GPDW-MR: ASTM C 1396/C 1396M with moisture- and mold-resistant core and surfaces.
 - 1. Core: 5/8 inch, Type X.
 - 2. Long Edges: Tapered.
 - 3. Mold-Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
 - 4. Face Sheets: 100 percent post-consumer recycled content.
 - 5. Location: Interior face of all exterior walls; walls and ceilings of toilet/shower rooms, toilet rooms and janitor closets, except as indicated otherwise; and where indicated.
 - a. Note: Do not use moisture- and mold-resistant board behind tile; use tile backer board behind tile on walls.
 - 6. Products:
 - a. G-P Gypsum Corp.; Toughrock Mold-Guard Gypsum Board.
 - b. National Gypsum Co.; Gold Bond Brand XP Gypsum Board.
 - c. United States Gypsum Co.; Mold Tough Panels.
- E. Abuse-Resistant Gypsum Wallboard: ASTM C 1396, manufactured to produce greater resistance to surface indentation, through-penetration (impact resistance), and abrasion than standard, regular-type and Type X gypsum board.
 - 1. Products:
 - a. G-P Gypsum Corp.; ToughRock Fireguard Abuse Guard Gypsum Board.
 - b. National Gypsum Company; Gold Bond Hi-Abuse XP Wallboard.
 - b. United States Gypsum Co.; Mold Tough AR Gypsum Panels.
 - 2. Core: 5/8 inch, Type X.
 - 3. Surface Abrasion Resistance: ASTM C 1629, not less than Level 2.
 - 4. Indentation Resistance: ASTM C 1629, Level 1 or greater.
 - 5. Soft Body Impact Resistance: ASTM C 1629, not less than Level 2.
 - 6. Hard Body Impact Resistance: ASTM C 1629, Level 1 or greater.
 - 7. Mold-Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

8. Long Edges: Tapered.
9. Location: As indicated.
 - a. Note: Do not continue abuse-resistant behind tile wainscot; use tile backer board behind wall tile.

F. Impact-Resistant Gypsum Wallboard: ASTM C 630 and C 1396, Type X; gypsum core wall panel with additives to enhance fire- and mold/mildew-resistance of core; surfaced with abrasion-, moisture-, and mold/mildew-resistant paper on the front, back and long edges; with a fiberglass mesh embedded to backside of core to enhance impact/penetration resistance.

1. Products:
 - a. Hi-Impact Brand XP Fire-Shield Wallboard; National Gypsum Company.
 - b. Mold Tough VHI (Very High Impact) Firecode Core Panel; United States Gypsum Co.
2. Thickness: 5/8 inch.
3. Long Edges: Tapered.
4. Surface Abrasion Resistance: ASTM C 1629, Level 3.
5. Indentation Resistance: ASTM C 1629, Level 1.
6. Soft Body Impact Resistance: ASTM C 1629, Level 3.
7. Hard Body Impact Resistance: ASTM C 1629, Level 3.
8. Mold/Mildew Resistance: ASTM D 3273, not less than 10.

2.7 BACKING PANELS

A. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M.

1. Core: 5/8 inch, Type X.

2.8 TRIM ACCESSORIES

A. Interior Metal Trim: ASTM C 1047, galvanized steel.

1. Shapes:
 - a. Cornerbead: 1-1/4 inch x 1-1/4 inch external corner with 1/8-inch nose bead. Use at outside corners, unless otherwise indicated.
 - b. LC-Bead (Casing): J-shaped casing with 1/16-inch nose bead ground, not less than 30 gage; exposed long flange receives joint compound; use at exposed panel edges.
 - c. Expansion (Control) Joint: One-piece control joint formed with V-shaped slot and removable strip covering slot opening.

B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.

1. Product: Provide the following products from Pittcon Industries or Architect approved equal:
 - a. Radiused Outside Corner: Softforms SO Series, Model S0-9-075.
 - b. Trim Reveal: Softforms STR Series, Model STR-050-063.
2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221, alloy 6063-T5.
3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.
4. Profiles: .
 - a. Radiused Outside Corner: As indicated.
 - b. Trim Reveal: 1/2-inch wide by 5/8-inch deep.

2.9 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape:
 - 1. Interior Gypsum Wallboard: Paper reinforcing tape. Fiberglass tape not permitted.
 - 2. Glass-Mat, Water-Resistant Tile Backing Panels: As recommended by panel manufacturer.
- C. Setting-Type Joint Compound: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
 - 1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
- D. Drying-Type Joint Compound: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
 - 1. Ready-Mixed Formulation: Factory-mixed product.
- E. Type of Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, beveled panel edges, and damaged surface areas, use setting-type taping compound.
 - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - 3. Fill Coat: For second coat, use setting-type, sandable topping compound.
 - 4. Finish Coat: For third coat, use setting-type, sandable topping compound.
 - 5. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.
- F. Joint Compound for Tile Backing Panels:
 - 1. Glass-Mat, Water-Resistant Backing Panel: As recommended by manufacturer.

2.10 ACOUSTICAL SEALANT

- A. Products:
 - 1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
 - 2. Acoustical Sealant for Concealed Joints:
 - a. Ohio Sealants, Inc.; Pro-Series SC-175 Acoustical Sound Sealant.
 - b. Pecora Corp.; AIS-919.
 - c. Tremco, Inc.; Tremco Acoustical Sealant.
- B. Acoustical Sealant for Exposed and Concealed Joints: Nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
- C. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), recommended for sealing interior concealed joints to reduce airborne sound transmission.

2.11 SEALANTS FOR FIRE-RESISTANCE-RATED CONSTRUCTION

- A. General: Provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Materials shall comply with Division 07 Section "Fire-Resistive Joint Systems" and submitted UL assemblies.
 - 1. Provide firestopping where fire rated gypsum board assemblies butt masonry, steel deck, joists, beams, and structural members as part of the gypsum board assembly work.
 - 2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
 - 3. Joints shall be sealed with fire-resistance-rated sealants; use of joint compound for sealing of joints is not permitted.
- C. Exposed Fire-Resistive Joint Sealants: Exposed sealants shall be paintable.

2.12 SOUND ISOLATION MATERIALS

- A. Noise Proofing Compound (Green Glue): ASTM E 90, viscoelastic damping compound.
 - 1. Airborne Sound Transmission: ASTM E 492, passes.
 - 2. Surface-Burning Characteristics: ASTM E 84, maximum flame-spread and smoke-developed indices of 25 and 50, respectively.
 - 3. Mold-Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
 - 4. Product: CertainTeed Corp.; Green Glue.
- B. Sound Attenuation Batts: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass that is fire resistance in accordance with ASTM E 136 and sound control in accordance with ASTM E 423; designed to reduce airborne sound transmission; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics. Thermal fiberglass insulation not allowed.
 - 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of UL assemblies indicated.
 - 2. Sound Attenuation Batts in Wall Assemblies: Provide in thickness for full depth of cavity. Where cavity requires insulation that is thicker than standard size, install next larger size and compress into cavity.
 - 3. Products:
 - a. Johns Manville; Fiberglass Sound Control Batts.
 - b. Knauf Insulation; Quiet Therm Acoustical/Thermal Batt Insulation.
 - c. Owens Corning; Sound Attenuation Batt Insulation.

2.13 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
 - 1. Fastening gypsum board to steel members: Type S bugle head.
 - 2. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

- C. Unfaced Mineral Wool Filler (Firesafing): ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from rock wool; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
 - 1. Thickness: As required to fill void in one thickness.
 - 2. Manufacturers:
 - a. Fibrex Insulations Inc.
 - b. Johns Manville Corporation.
 - c. Thermafiber.
- D. Thermal Insulation: As specified in Division 07 Section "Building Insulation."
- E. Insulation Support Anchors: Continuous, galvanized metal support strip, 25 gage, with pre-punched tabs at 8 inches on center.
 - 1. Product: Insul-hold; Insul-Hold Co., Inc.; phone (207) 465-9066.
- F. Firestopping:
 - 1. Provide firestopping where fire rated gypsum board assemblies butt masonry, steel deck, joists, beams, and structural members as part of the gypsum board assembly work. See Division 07 Section "Fire-Resistive Joint Systems."
 - 2. Penetrations through fire-resistant rated and smoke walls and partitions by Divisions 21, 22, 23, 26, 27, and 28 work, including both empty openings and openings containing cables, pipes, ducts and conduits are specified as part of the Divisions 21, 22, 23, 26, 27, and 28 work. Sealing of penetrations shall be in accordance with Division 07 Section "Penetration Firestopping."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.
- D. Post-Installation Inspection: Inspect walls for dents and imperfections, with Installer and painter present, prior to painting. Verify exposed joints are finished up to required heights (to above acoustical ceilings). Inspect wall again after primer and first coat of paint applied, with Installer and painter present. Installer shall touch-up as follows:
 - 1. Touch-up visible gypsum board imperfections before priming of walls.
 - 2. Touch-up imperfections found in field of boards and joints made visible from painting after first finish coat applied.
 - 3. Joint compound touch-up shall be primed and painted and viewed for acceptability before final coat is applied.

3.2 STEEL FRAMING INSTALLATION, GENERAL

- A. Installation Standards: ASTM C 754, and ASTM C 840 requirements that apply to framing installation.
- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with gypsum board manufacturer's written recommendations or, if none available, with United States Gypsum's "Gypsum Construction Handbook."
- C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement. Comply with details shown on Drawings.
 - 1. Isolate ceiling assemblies where they abut or are penetrated by building structure.
 - 2. Isolate partition framing and wall furring where it abuts structure, except at floor. Install slip-type joints at head of assemblies that avoid axial loading of assembly and laterally support assembly.
 - a. Allow for 3/4-inch deflection at floors assemblies above.
 - b. Install deflection track top runner or deflection brackets to attain lateral support and avoid axial loading.
 - c. Install deflection firestop track top runner at fire-resistance-rated assemblies.
 - 1) Attach jamb studs at openings to tracks using manufacturer's standard stud clip.

3.3 INSTALLATION OF CEILING JOIST FRAMING

- A. Install perimeter framing track sized to match ceiling joist framing. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on approved Shop Drawings.
- B. Install ceiling joist framing bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten ceiling joist framing to both flanges of joist track.
- C. Space ceiling joist framing not more than 2 inches from abutting walls, and not more than 16 inches on center.
- D. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.

3.4 INSTALLING STEEL PARTITION AND SOFFIT FRAMING

- A. Install tracks (runners) at floors, ceilings, and structural walls and columns where gypsum board assemblies abut other construction.
- B. Installation Tolerance: Install each steel framing and furring member so fastening surfaces vary not more than 1/8 inch from the plane formed by the faces of adjacent framing.
- C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
 - 1. Cut studs 1/2 inch short of full height to provide perimeter relief. Do not fasten studs to top track to allow independent movement of studs and track.
 - 2. For fire-resistance-rated partitions that extend to the underside of floor slabs and decks or other continuous solid-structure surfaces to obtain ratings, install framing around structural

and other members extending below floor/roof slabs and decks, as needed to support gypsum board closures and to make partitions continuous from floor to underside of solid structure.

- a. Fire-resistance rated designs shall maintain integrity throughout repetitive deflection cycles.
- D. Install steel studs at the following spacings:
1. Single-Layer Construction: 16 inches o.c., unless otherwise indicated.
 2. Multilayer Construction: 16 inches o.c., unless otherwise indicated.
- E. Install steel studs so flanges point in the same direction and leading edge or end of each panel can be attached to open (unsupported) edges of stud flanges first.
1. Attach both flanges to floor runner track with screws. Do not fasten studs to top track to allow independent movement of studs and track.
- F. Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
1. Install two studs at each jamb, unless otherwise indicated.
 2. Install cripple studs at head adjacent to each jamb stud, with a minimum 1/2-inch clearance from jamb stud to allow for installation of control joint.
 3. Extend jamb studs through suspended ceilings and attach to underside of floor or roof structure above, even when partitions are not full height. Provide diagonal bracing at tall partitions to stop deflection and vibration of studs when doors are slammed shut.
 4. Extend jamb studs one-piece full height.
- G. Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
- H. Installation Tolerance: Framing members shall be within the following limits:
1. Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing, a total variation of 1/4 inch in 8 feet from a true plane.
 2. Layout of Walls and Partitions: 1/4 inch from intended position.
 3. Plates and Runners: 1/4 inch in 10 feet from a straight line.
 4. Studs: 1/4 inch in 10 feet out of plumb, not cumulative.
 5. Headers and Sills of Openings: 1/8 inch from level across width of opening.
 6. Soffits: 1/4 inch in 10 feet from level straight line.
 7. Spacing of Framing Members: Comply with requirements of ASTM C 754.
- I. Fire-Resistance-Rated Partitions: Install framing to comply with fire-resistance-rated assembly indicated and support closures and to make partitions continuous from floor to underside of solid structure. Install framing around structural and other members extending below floor/roof slabs and decks, as needed to support gypsum board closures and to make partitions continuous from floor to underside of solid structure.
1. Firestop Track: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
 - a. Fire-resistance rated and STC rated joint designs shall maintain integrity throughout repetitive deflection cycles.

3.5 INSTALLATION OF ACOUSTICAL INSULATION

- A. Install sound attenuation blankets at locations indicated before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement. Install insulation in voids as framing is installed that that would be inaccessible after completion of framing.
- B. Install a single layer of insulation of required thickness to fill the full depth of cavity, unless otherwise shown. Where cavity requires insulation that is thicker than standard size, install next larger size and compress into cavity.
- C. Hold batt insulation in place with insulation support anchors located at 5 feet on center full height of wall, starting at the top of each stud space.
- D. Stuff glass fiber loose fill insulation into miscellaneous voids and cavity spaces. Fill box headers, and voids while framing is being erected that will be inaccessible for installation later. Compact to approximately 40 percent of normal maximum volume (to a density of approximately 2.5 pcf).

3.6 INSTALLATION OF MINERAL WOOL INSULATION

- A. Install mineral wool insulation at locations indicated before installing gypsum panels. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement. Install insulation in voids as framing is installed that that would be inaccessible after completion of framing.

3.7 APPLYING AND FINISHING PANELS, GENERAL

- A. Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216, except as specified otherwise.
 - 1. Comply with requirements of UL assemblies indicated for fire-rated construction.
- B. Install sound attenuation batt insulation, where indicated, before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.
- C. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- E. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- F. Attachment to Steel Framing: Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- G. Attach gypsum panels to framing provided at openings and cutouts.
- H. Form control and expansion joints with space between edges of adjoining gypsum panels.
 - 1. Where control joints are not shown, provide control joints at a maximum spacing of 30 feet; review proposed locations with Architect prior to commencement of work.

- a. Where abuse-resistant and impact-resistant panels are used, provide control joints at a maximum spacing of 28 feet; review proposed locations with Architect prior to commencement of work.
- I. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect beams, joists, and other structural members projecting below underside of floor slabs and decks, cut gypsum panels to fit profile formed by beams, joists, and other structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.
 - 4. Run board to within 1/4 inch of floor slabs to prevent wicking and to provide full support of resilient base.
 - 5. Caulk smoke partitions with acoustical sealant on both sides of wall at head and sill to prevent the passage of smoke.
 - 6. Caulk fire-rated assemblies with fire-rated acoustical sealant on both sides of wall at head and sill to prevent the passage of smoke, gases and sound.
 - 7. Fire-resistance rated joint designs shall maintain integrity throughout repetitive deflection cycles.
- J. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with casing bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
 - 1. Use fire-rated acoustical sealant for fire-rated walls.
- K. Smoke Partitions: Where smoke partitions are indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant on both sides of wall at head and sill. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
 - 1. Exterior Walls: Install continuous bead of acoustical sealant at base of all exterior walls sealing between edge of gypsum panels and floor slab. Joints to receive sealant shall be clean and dry, free of dirt, dust and debris. Install continuous bead of acoustical sealant at top of all exterior walls sealing between edge of gypsum panel and underside of floor slab. Tool material smooth and uniform to insure good contact and adhesion to substrate.
- L. Fire-Rated Assemblies: Where fire-rated assemblies are indicated, seal construction at perimeters and behind control joints with continuous beads of fire-rated acoustical sealant on both sides of wall at head and sill. Comply with ASTM E 1966 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings.
 - 1. Joints to receive sealant shall be clean and dry, free of dirt, dust and debris.
- M. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
 - 1. Space screws a maximum of 12 inches o.c. for vertical applications.
- N. Space fasteners in panels that are tile substrates a maximum of 8 inches o.c.
- O. Remove screws that do not hit studs, supports, or blocking and repair hole left by screw removal.

3.8 PANEL APPLICATION METHODS

- A. Single-Layer Application:
 - 1. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of board.
 - 2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- B. Multilayer Application on Partitions/Walls: Apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - 1. Where indicated, apply second layer of gypsum board or first layer of gypsum board over plywood wall sheathing with noise proofing compound (Green Glue) in accordance with manufacturer's written instructions and the following:
 - a. Seal the seams between the first layer with either acoustical sealant or dywall compound taking care to creating a smooth, level surface allowing second lay to lay flat when installed.
 - b. Remove dust or debris from face of first layer and from back of second layer.
 - c. Apply prescribed quantity of noise proofing compound in a random pattern to back of second layer of gypsum board leaving a 2- to 3-inch border around edge of board without any compound.
 - d. Apply coated gypsum board layer to first layer and screw into place. Seal seams and cracks with acoustical sealant. Seal wall/floor intersection and wall/ceiling intersection with acoustical sealant.
 - e. Seal all penetrations in assemblies with acoustical sealant.
- C. Single-Layer Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- D. Multilayer Fastening Methods: Fasten base layers and face layers separately to supports with screws.

3.9 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Install corner bead at external corners. Where indicated, install radiused, extruded aluminum corner beads.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.
 - 1. Install LC-bead (casing bead) where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
 - 2. Install U-bead where indicated.
- D. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.
 - 1. Review locations of control joints with Architect prior to start of gypsum panel installation.
- E. Aluminum Trim: Install in locations indicated on Drawings.

3.10 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Treat gypsum board joints, interior angles, flanges of corner bead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, beveled edges, and damaged surface areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints and to flanges of trim accessories, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
 - 1. Level 1: At ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
 - 2. Level 2: At ceiling plenum areas, concealed areas, and where indicated, for fire-resistance-rated assemblies, smoke assemblies and sound-rated assemblies.
 - 3. Level 2: Where panels are substrate for tile and where indicated.
 - 4. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.
 - 5. Level 5: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire surface at abuse-resistant and impact-resistant board surfaces.
- E. Glass-Mat, Water-Resistant Backing Panels: Finish board forming base for ceramic tile to comply with ASTM C 840 and according to manufacturer's written instructions for treatment of joints behind tile.
- F. Where Level 1 gypsum board finish is indicated, embed tape in joint compound. Surface shall be free of excess joint compound.
- G. Where Level 2 gypsum board finish is indicated, fill fastener heads, embed tape in joint compound and apply thin coat of joint compound over all joints and interior angles.
- H. For Level 4 gypsum board finish, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects and ready for decoration.
 - 1. At tapered edge joints, draw compound down to a level plane, leaving a monolithic surface that is flush with paper face. Finish coat shall be feathered a minimum of 8 inches beyond both sides of center of joint tape.
 - 2. At end-to-end butt joints, draw compound down to minimize hump created by joint tape application. Finish coat shall be feathered a minimum of 16 inches beyond both sides of center of joint tape.
 - 3. End product shall be a surface that appears level without telegraphing joint locations as high spots when viewed down wall after painting.
 - 4. Finish board to within 1/2 inch of floor, providing full support for resilient wall base without telegraphing joint.
- I. Where Level 5 gypsum board finish is indicated, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories as specified above for Level 4; and apply a thin, uniform skim coat of joint compound over entire surface. For skim coat, use joint compound specified for third coat, or a product

specially formulated for this purpose and acceptable to gypsum board manufacturer. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects, tool marks, and ridges and ready for decoration.

3.11 FIELD QUALITY CONTROL

- A. Above-Ceiling Observation: Before Contractor installs gypsum board ceilings, Architect will conduct an above-ceiling observation and report deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.
 - 1. Notify Architect seven days in advance of date and time when Project, or part of Project, will be ready for above-ceiling observation.
 - 2. Before notifying Architect, complete the following in areas to receive gypsum board ceilings:
 - a. Installation of 80 percent of lighting fixtures, powered for operation.
 - b. Installation, insulation, and leak and pressure testing of water piping systems.
 - c. Installation of air-duct systems.
 - d. Installation of air devices.
 - e. Installation of mechanical system control-air tubing.
 - f. Installation of above ceiling automatic fire suppression piping, including leak and pressure testing.
 - g. Installation of ceiling support framing.

3.12 CLEANING

- A. Promptly remove any residual joint compound from adjacent surfaces.

3.13 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 092950

SECTION 096516 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Unbacked rubber sheet flooring.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of resilient sheet flooring.
 - 1. Include sheet flooring layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 2. Show details of special patterns.
- C. Samples for Initial Selection: For each type of resilient sheet flooring indicated.
- D. Samples for Verification: For each type of resilient sheet flooring, in manufacturer's standard size, but not less than 6-by-9-inch (150-by-230-mm) sections of each color, texture, and pattern required.
 - 1. For heat-welding bead, manufacturer's standard-size Samples, but not less than 9 inches (230 mm) long, of each color required.
- E. Welded-Seam Samples: For seamless-installation technique indicated and for each resilient sheet flooring product, color, and pattern required; with seam running lengthwise and in center of 6-by-9-inch (150-by-230-mm) Sample applied to a rigid backing and prepared by Installer for this Project.
- F. Product Schedule: For resilient sheet flooring. RSI.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of resilient sheet flooring to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Resilient Sheet Flooring: Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, in roll form and in full roll width for each type, color, and pattern of flooring installed.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for resilient sheet flooring installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by resilient sheet flooring manufacturer for installation techniques required.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient sheet flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store rolls upright.

1.9 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 85 deg F (29 deg C), in spaces to receive resilient sheet flooring during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C) .
- C. Close spaces to traffic during resilient sheet flooring installation.
- D. Close spaces to traffic for 48 hours after resilient sheet flooring installation.
- E. Install resilient sheet flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient sheet flooring, as determined by testing identical products according to ASTM E648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 UNBACKED RUBBER SHEET FLOORING - RS1

- A. Basis of Design: Noraplan Convia Sheet Rubber
- B. Product Standard: ASTM F1859.
 - 1. Type: Type I, homogeneous rubber sheet floor covering.
 - 2. Thickness: As standard with manufacturer.
 - 3. Hardness: Manufacturer's standard hardness, measured using Shore, Type A durometer per ASTM D2240.
- C. Wearing Surface: Smooth.
- D. Sheet Width: 4.0 feet (1.2 m).
- E. Seamless-Installation Method: [Heat welded] [Chemically bonded] <Insert requirements>.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.
- C. Seamless-Installation Accessories:
 - 1. Chemical-Bonding Compound: Manufacturer's product for chemically bonding seams.
- D. Integral-Flash-Cove-Base Accessories:
 - 1. Cove Strip: 1-inch (25-mm) radius provided or approved by resilient sheet flooring manufacturer.
 - 2. Cap Strip: Square metal, vinyl, or rubber cap provided or approved by resilient sheet flooring manufacturer.
 - 3. Corners: Metal inside and outside corners and end stops provided or approved by resilient sheet flooring manufacturer.

- E. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient sheet flooring manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient sheet flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet flooring.
- B. Concrete Substrates: Prepare according to ASTM F710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
 - 4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft. (18.6 sq. m), and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
 - b. Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient sheet flooring until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

3.3 RESILIENT SHEET FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
- B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.
- C. Lay out resilient sheet flooring as follows:
 1. Maintain uniformity of flooring direction.
 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches (152 mm) away from parallel joints in flooring substrates.
 3. Match edges of flooring for color shading at seams.
 4. Avoid cross seams.
- D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.
- H. Adhere resilient sheet flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. Seamless Installation:
 1. Chemically Bonded Seams: Bond seams with chemical-bonding compound to fuse sections permanently into a seamless flooring installation. Prepare seams and apply compound to produce tightly fitted seams without gaps, overlays, or excess bonding compound on flooring surfaces.
- J. Integral-Flash-Cove Base: Cove resilient sheet flooring 6 inches (152 mm) up vertical surfaces. Support flooring at horizontal and vertical junction with cove strip. Butt at top against cap strip.
 1. Install metal corners at inside and outside corners.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.
- B. Perform the following operations immediately after completing resilient sheet flooring installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient sheet flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, adhesive, and blemishes from flooring surfaces before applying liquid floor polish.
 - 1. Apply three coat(s).
- E. Cover resilient sheet flooring until Substantial Completion.

END OF SECTION 096516

SECTION 099000 - PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Exposed exterior items and surfaces with low VOC coatings complying with New Hampshire DEP regulations (OTC regulations).
 - 2. Exposed interior items and surfaces with low VOC coatings complying with New Hampshire DEP regulations (OTC regulations).
 - 3. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Related Sections include the following:
 - 1. Division 08 Section "Hollow Metal Frames" for factory priming steel frames.
 - 2. Division 08 Section "Bullet-Resistant Assemblies" for surface preparation of wood veneered doors.
 - 3. Division 09 Section "Gypsum Board Assemblies" for surface preparation of gypsum board.
 - 4. Review all sections for shop primed items requiring field painting.

1.3 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
 - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
 - 2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
 - 3. Satin refers to low-sheen finish with a gloss range between 15 and 35 when measured at a 60-degree meter.
 - 4. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
 - 5. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

- A. General: Submit in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: For each paint system indicated. Include block fillers and primers.
 - 1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material proposed for use.

3. Include printed statement of VOC content for each product.
- C. Schedule: Provide schedule of all surfaces to be coated, with prime and finish coat material listed, and manufacturer's recommended wet film thickness.
- D. Samples: For each type of exposed finish required, submit color chips, 3- by 5-inches, matching colors indicated on Finish Schedule.
- E. Qualification Data: For Applicator.
- F. Color Mix Code: For all colors used for Project to include in Owner's Manual.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced Applicator who has completed painting system applications similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers, primers and undercoat materials for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Duplicate finish of approved sample Submittals.
 1. Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted.
 - a. Wall Surfaces: Provide samples of at least 100 sq. ft.
 - b. Small Areas and Items: Architect will designate items or areas required.
 2. After permanent lighting and other environmental services have been activated, apply benchmark samples, according to requirements for the completed Work. Provide required sheen, color, and texture on each surface.
 - a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.
 3. Final approval of colors will be from benchmark samples.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
 1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.
 5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly.
2. Remove oily rags and waste daily.
3. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.7 PROJECT CONDITIONS

- A. Apply paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.
- B. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.
 2. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before proceeding with or continuing coating operation.

1.8 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied and in the quantities described below. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner.
 1. Quantity: Furnish Owner with not less than 1 gal., of each material and color applied for Owner's use during move in.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 1. Benjamin Moore & Company (Moore).
 2. Devoe High Performance Coatings (DC); a division of Akzo Nobel.
 3. PPG Architectural Finishes, Inc. (PPG).
 4. Sherwin-Williams Co. (S-W).
 5. Flame Control Coatings, LLC (Flame Control); phone: (716) 282-1399; available through Sherwin-Williams.
- B. Substitutions: Materials shall be as specified herein, except, consideration shall be given to other products that meet or exceed those specified if requested 5 business days prior to the date of bid in accordance with Section 01600 "Product Requirements."

2.2 COATINGS MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Material Quality: Provide manufacturer's best quality coating material of the various coating types specified that are factory formulated and recommended by manufacturer for application

indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers listed in the specification schedule. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
 2. Where schedule says no substitution, use proprietary product only. Do not propose substitution, as the products from the other manufacturers have been considered, and are not acceptable.
- C. VOC Compliance for Interior Paints and Coatings: Provide the manufacturer's formulation for the products specified below that are VOC compliant with the State of New Hampshire Department of Environmental Protection Regulations and the following chemical restrictions from the Ozone Transport Commission (OTC) expressed in grams per liter:
1. Flat Paints and Coatings: VOC content of not more than 100 g/L.
 2. Non-Flat Paints and Coatings: VOC content of not more than 150 g/L.
 3. Non-Flat Paints and Coatings - High Gloss: VOC content of not more than 250 g/L.
 4. Anticorrosive (Rust Preventative) Coatings: VOC content of not more than 400 g/L.
 5. Fire Retardant Coatings:
 - a. Opaque: VOC content of not more than 350 g/L.
 6. Industrial Maintenance Coatings (IMC): VOC content of not more than 340 g/L.
 7. Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
 8. Quick-Dry Enamels: VOC content of not more than 250 g/L.
 9. Quick-Dry Primers, Sealers, and Undercoaters: VOC content of not more than 200 g/L.
 10. Specialty Primers, Sealers, and Undercoaters: VOC content of not more than 350 g/L.
- D. Colors: Provide colors as indicated in Material Legend; if color is not indicated, color shall be as selected by the Architect from the manufacturer's full range of options.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator and drywall subcontractor present, under which painting will be performed for compliance with paint application requirements.
1. Inspect walls for dents and imperfections prior to painting. Inspect walls again after primer and first coat of paint applied, with Applicator and drywall subcontractor present. Drywall subcontractor shall touch-up as follows:
 - a. Touch-up visible gypsum board imperfections before priming of walls.
 - b. Touch-up imperfections found in field of boards and joints made visible from painting after first finish coat applied.
 2. If unacceptable conditions are encountered, prepare written report, endorsed by Applicator, listing conditions detrimental to performance of work.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 4. Application of coating indicates Applicator's acceptance of surfaces and conditions within a particular area.
 5. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of specified finish materials to ensure use of compatible primers.
 - 1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others or previously painted.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Sand exposed wood framing members to remove exposed grade stamps.
 - b. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer.
 - c. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood.
 - d. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - e. If transparent finish is required, backprime with spar varnish.
 - 3. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's standards.
 - a. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - b. Touch up bare areas and shop-applied prime coats that have been damaged. Clean with solvents recommended by paint manufacturer and SSPC SP2; and touch up with same primer as the shop coat.
- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
 - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 3. Provide finish coats that are compatible with primers used.
 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convactor covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 8. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 2. Omit primer over metal surfaces that have been shop primed and touchup painted, unless otherwise indicated.
 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Paint all exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.
1. Painting includes field painting of exposed bare and covered pipes and ducts (including color-coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment at all locations, except mechanical and electrical rooms.
- D. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
1. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

- E. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions. Walls shall have roller finish.
 - 1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
 - 2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
- F. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- G. Mechanical and Electrical Work: Painting of mechanical, plumbing, fire protection, and electrical work is limited to items exposed in occupied spaces (outside mechanical and electrical rooms).
- H. Mechanical, plumbing, and fire protection items to be painted include, but are not limited to, the following:
 - 1. Piping, pipe hangers and supports.
 - 2. Heat exchangers.
 - 3. Tanks.
 - 4. Ductwork, including interior of ductwork visible through air devices.
 - 5. Insulation.
 - 6. Accessory items.
- I. Electrical items to be painted include, but are not limited to, the following:
 - 1. Conduit and fittings.
 - 2. Panelboards.
- J. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- K. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- L. Transparent (Clear or Stained) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
 - 1. Provide satin finish for final coats, unless otherwise noted.
- M. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
- N. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

- O. Interior Ferrous Metal Items to Be Painted Include, but Are Not Limited To, the Following:
 - 1. Steel door frames.
 - 2. Access panels (both sides).
 - 3. Metal fabrications; see Division 05 Section "Metal Fabrications."
 - 4. Miscellaneous metal items.

3.4 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
 - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.
- C. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces: Primer is not required on shop-primed items, except zinc-coated (galvanized) steel doors and frames, which require a primer under this specification.

3.6 LOW VOC INTERIOR COATINGS

- A. VOC Compliance, General: Provide the manufacturers' formulations for the products specified below that comply with the VOC requirements for the State of New Hampshire Department of Environmental Protection in as defined in paragraph 2.2.C of this Section.
- B. Gypsum Board: Provide the following finish systems over interior gypsum board:
 - 1. Flat Acrylic Finish, GPDW Soffits and Ceilings: 2 finish coats over a primer.
 - a. Primer: Low-odor, low VOC, latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
 - 1) Moore: Ben Premium Interior Latex Primer No. W624; 1.2 mils DFT.
 - 2) PPG: Speedhide zero 6-4900XI Interior Zero-VOC Latex Sealer; 1.2 mils DFT.
 - 3) S-W: ProMar 200 Interior Latex Primer, B28W08200 Series; 1.1 mils DFT.
 - b. First and Second Coats: Low-odor, low VOC, flat, acrylic-latex-based, interior paint applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
 - 1) Moore: Ben Premium Interior Latex Flat No. W625; 1.2 mils DFT per coat.
 - 2) PPG: Speedhide zero 6-4110XI Interior Latex Zero-VOC Flat; 1.3 mils DFT per coat.
 - 3) S-W: ProMar 200 Interior Latex Flat, B30W200 Series; 1.3 mils DFT per coat.

2. Semigloss, Acrylic-Latex Finish, Walls: 2 finish coats over a primer.
 - a. Primer: Latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
 - 1) Moore: Ben Premium Interior Latex Primer No. W624; 1.2 mils DFT.
 - 2) PPG: Speedhide zero 6-4900XI Interior Zero-VOC Latex Sealer; 1.2 mils DFT.
 - 3) S-W: ProMar 200 Interior Latex Flat, B30W200 Series; 1.5 mils DFT.
 - 4) Note: Verify bond of primer to existing semi-gloss and gloss hard, slick surfaces. Where full bond of specified primer does not occur, provide a bonding primer.
 - b. First and Second Coats: Semigloss, interior acrylic-latex, interior finish applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
 - 1) Moore: Ben Premium Interior Latex Semi-Gloss No. W627; 1.5 mils DFT per coat.
 - 2) PPG: Speedhide zero 6-4510XI Interior Zero-VOC Latex Semi-Gloss; 1.3 mils DFT per coat.
 - 3) S-W: ProMar 200 Interior Latex Semi-Gloss, B31W2200 Series; 1.5 DFT per coat.
 3. Semigloss, Waterborne Epoxy Finish, Walls and Ceilings: 2 finish coats over a primer.
 - a. Primer (New and Patched Areas): Latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
 - 1) Moore: Waterborne Acrylic Epoxy Primer No. M08/M09; 1.5 mils DFT.
 - 2) GP: 1000-1200, Prep & Prime Hi-Hide Wall Interior Water-Based Primer Sealer; 1.9 mils DFT.
 - 3) S-W: ProGreen 200 Low VOC Interior Latex Primer, B28W600 Series; 1.5 mils DFT.
 - 4) Note: Verify bond of primer to existing semi-gloss and gloss hard, slick surfaces. Where full bond of specified primer does not occur, provide a bonding primer.
 - b. First and Second Coats: Semigloss, waterborne or acrylic based epoxy finish applied at spreading rate recommended by the manufacturer to achieve a dry mill thickness of not less than indicated for product.
 - 1) Moore: IMC Acrylic Epoxy Coating No. M43/M44; 2.0 mils DFT per coat.
 - 2) DC: 4426-XXXX Tru-Glaze-WB Waterborne Epoxy Semi-Gloss Coating; 3.5 mils DFT per coat.
 - 3) S-W: Pro Industrial Pre-Catalyzed Waterbased Epoxy No. K46-150 Series; 1.5 mils DFT per coat.
- C. Ferrous Metal: Provide the following finish systems over ferrous metal. Primer is not required on shop-primed items, except steel door, which require a primer under this specification. Prime bare spots and cracks on ferrous metals.
1. Semigloss, Water Based Alkyd Enamel Finish: 2 finish coats over a primer.
 - a. Primer: Quick-drying, corrosion resistant, single component, acrylic-modified alkyd primer or self cross-linking acrylic primer, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.

- 1) Moore: Advance Waterborne Interior Alkyd Primer No. 790; 1.6 mils DFT.
 - 2) PPG: Speedhide 6-208 Interior/Exterior Rust Inhibitive Steel Primer; 2.3 mils DFT.
 - 3) S-W: Pro Industrial Pro-Cryl Universal Primer B66-310 Series; 3.0 mils DFT.
 - 4) Note: Verify bond of specified primer to existing semi-gloss and gloss hard, slick surfaces. Where full bond of specified primer does not occur, provide a specialty bonding primer.
- b. First and Second Coats: Low VOC, semigloss, single component, acrylic-modified alkyd interior enamel applied at spreading rate recommended by the manufacturer to achieve a dry film thickness of not less than indicated for product.
- 1) Moore: Advance Waterborne Interior Alkyd Gloss No. 794; 1.6 mils DFT per coat.
 - 2) PPG: Speedhide 6-1510 Series Interior/Exterior WB Alkyd Semi-Gloss; 1.5 mils DFT per coat.
 - 3) S-W: ProMar 200 Interior Waterbased Acrylic-Alkyd Semi-Gloss, B34-8200 Series; 1.7 mils DFT per coat.
- D. Telecommunication, Data and Electrical Backboards: Provide the following finish over plywood:
1. Flat Intumescent Finish: Two finish coats over a primer.
 - a. Primer: Latex-based, interior primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than indicated for product.
 - 1) Moore: Fresh Start High-Hiding All-Purpose Primer No. 056; 1.4 mils DFT.
 - 2) SW: Preprite Problock Interior/Exterior Latex Primer\Sealer; 1.4 mils DFT.
 - b. First and Second Coats: Intumescent-type, fire-retardant paint applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 4 mils; white color for telecommunication and black for electrical.
 - 1) Moore: P59 220 Latex Fire-Retardant Coating.
 - 2) FlameControl: 20-20A Flat Latex Intumescent Coating.
- E. Smoke and Fire-Rated Partition Identification: Identify all smoke partitions and all fire-rated walls and partitions by stenciling rating on each side of rated walls above ceiling line with 4 inch high letters in red or orange semigloss paint; each rated wall shall be identified with fire rating of wall at least once and at a spacing not greater than 12 feet o.c. and not more than 5 feet from each end of the wall. Identify all smoke barriers and partitions by stenciling "SMOKE" on each side of walls above ceiling line with 4 inch high letters in bright green semigloss paint; each rated wall shall be identified at least once and at a spacing not greater than 12 feet o.c. and not more than 5 feet from each end of wall.
1. First Coat: Low odor, zero VOC, semigloss, acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than indicated for product.
 - a. Moore: Ben Premium Interior Latex Semi-Gloss No. W627; 1.5 mils DFT.
 - b. PPG: Speedhide zero 6-4510 Interior Zero-VOC Latex Semi-Gloss; 1.3 mils DFT.
 - c. S-W: ProGreen 200 Interior Latex Semi-Gloss B31W2200 Series; 1.5 mils DFT.

END OF SECTION 099000

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SECTION 102800 - TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Toilet and bath accessories.
- B. Related Sections include the following:
 - 1. Division 06 Section "Rough Carpentry" for concealed wood blocking to support accessories.

1.3 SUBMITTALS

- A. General: Submit in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: Include construction details, material descriptions and thicknesses, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.
- C. Shop Drawings: Include blocking locations and mounting heights identified.
- D. Setting Drawings: For cutouts required in other work; include templates, substrate preparation instructions, and directions for preparing cutouts and installing anchoring devices.
- E. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use room and accessory designations indicated in the Toilet and Bath Accessory Schedule in Part 3 and room and accessory designations indicated on Drawings.
- F. Maintenance Data: For accessories to include in maintenance manuals specified in Division 01. Provide lists of replacement parts and service recommendations.
- G. Warranties: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise approved by Architect.
- B. Insofar as possible, fitting, construction and fabrication of the work shall be executed at shop, ready for delivery and erection at building.
- C. Provide all holes, connections, and fastenings for and to work of other trades abutting, adjoining or intersecting work of this Section.

1.5 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.

1.6 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Mirror Warranty: Written warranty, executed by mirror manufacturer agreeing to replace mirrors that develop visible silver spoilage defects within minimum warranty period indicated.
 - 1. Minimum Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Products: Subject to compliance with requirements, provide one of the products specified.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
- B. Substitutions: Materials shall be as specified herein, except, consideration shall be given to other products that meet or exceed those specified if requested 5 business days prior to the date of bid in accordance with Section 01600 "Product Requirements."

2.2 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch minimum nominal thickness, unless otherwise indicated.
- B. Sheet Steel: ASTM A 366/A 366M, cold rolled, commercial quality, 0.0359-inch minimum nominal thickness; surface preparation and metal pretreatment as required for applied finish.
- C. Galvanized Steel Sheet: ASTM A 653/A 653M, G60.
- D. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electrodeposited on base metal.
- E. Baked-Enamel Finish: Factory-applied, gloss-white, baked-acrylic-enamel coating.
- F. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411.

- G. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- H. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

2.3 ANTI-LIGATURE TOILET ACCESSORIES

- A. Individual, Curved, Towel Hook, Front Mount, TBA-1: Assembly with hook for towels that allows hook to pivot when load exceeds preset limit.
 - 1. Back Plate: Type 304, stainless steel, 14 gage, with exposed surfaces, satin finish; one-piece formed and ground smooth; provide with tamper-resistant mounting fasteners.
 - 2. Safety Hook: Cast and machined stainless steel or bright, chrome plated brass housing with stainless steel ball and spring.
 - 3. Products:
 - a. Norix Group, Inc.; Model ITH-110.
 - b. Bradley Corporation; Model SA31.
- B. Multiple, Straight, Clothes Hook, TBA-2: Minimum 5-1/2-inch- high backplate by length indicated, formed from stainless-steel sheet, 14 gage; stainless-steel straight, ball type hooks attached to backplate. Provide pivoting assembly that maintains pressure on hook and snaps down when load exceeds 8 lbf.
 - 1. Configuration: 18 inches long with four hooks.
 - 2. Mounting: Front mounting with security fasteners.
 - 3. Products:
 - a. Norix Group, Inc.; Model S565-531.
 - b. Bradley Corporation; Model SA41.
- C. Front Mounted, Recessed, Toilet Paper Holder, TBA-3: Minimum 6 1/8 inches wide by 3 3/8 inches deep; formed from type 304 stainless-steel sheet with one-piece seamless construction. Secure to wall with rear-mounting steel strap and adjustment bolts.
 - 1. Face: 6 1/8-inch- square face flange
 - 2. Products:
 - a. Bobrick B-667.
 - b. Bradley Corporation; Model 5105
- D. Grab Bars, TBA-4, TBA-5 & TBA-6: Provide stainless-steel grab bar, 1-1/2 inches diameter, welded to manufacturer's standard flanges with exposed mounting, closure plates formed from 0.125-inch thick stainless steel; furnish with torx-head mounting screws for installation to wall anchors; in configurations indicated. All-welded construction.
 - 1. Lengths:
 - a. TBA-4: 24 inches.
 - b. TBA-5: 36 inches.
 - c. TBA-6: 42 inches.
 - 2. Products:
 - a. Bradley Corporation; SA70 Series.
 - b. Norix Group, Inc.; Security Grab Bar.
- E. Frameless, Stainless Steel Mirror, TBA-10: Type 430, 22 gage or greater, stainless steel with No. 8 polished finish; 1/4-inch returns concealing 1/4-inch tempered Masonite backing bonded to mirror with adhesive; provide with tamper-resistant mounting fasteners.
 - 1. Size: As indicated.

2. Products:
 - a. Bradley Corporation; Model 748 Series.
 - b. Bobrick Washroom Equipment, Inc.; Model B-1556 Series.

2.4 FABRICATION OF ANTI-LIGATURE TOILET ACCESSORIES

- A. Coordinate dimensions and attachment methods of anti-ligature toilet accessories with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.
- B. Shear and punch metals cleanly and accurately. Remove burrs.
- C. Form edges and corners to be free of sharp edges and rough areas. Fold back exposed edges of unsupported sheet metal to form a 1/2-inch- wide hem on the concealed side, or ease edges to a radius of approximately 1/32 inch and support with concealed stiffeners.
- D. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- E. Weld corners and seams continuously to comply with referenced AWS standard and the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
 5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- F. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure detention toilet accessories rigidly in place and to support expected loads. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed-metal units as needed to attach and support other construction.
- G. Cut, reinforce, drill, and tap detention toilet accessories to receive hardware, security fasteners, and similar items.
- H. Form exposed work true to line and level with accurate angles and surfaces. Grind off and ease edges unless otherwise indicated.
- I. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed security fasteners of type indicated or, if not indicated, flat-head (countersunk) security fasteners. Locate joints where least conspicuous.
- J. Installation Accessories:
 1. Security Fasteners: Operable only by tools produced by fastener manufacturer or other licensed fabricator for use on specific type of fastener. Drive-system type, head style, material, and protective coating as required for assembly, installation, and strength

2. Epoxy Security Sealants: ASTM C 881, Type I and III, Grade 3, Class B, rigid, two-part, high-solids, high-modulus epoxy resin compound.
 - a. Product: Pecora Corporation; Dyna-Poxy EP-1200.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of anti-ligature toilet accessories.
 1. Examine roughing-in for embedded and built-in anchors to verify actual locations of anti-ligature toilet accessory connections before detention toilet accessory installation.
 2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of anti-ligature toilet accessories.
- B. Verify locations of anti-ligature toilet accessories.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws. Set units level, plumb, and square at locations indicated, according to manufacturer's written instructions for substrate indicated.
- C. Grab bars shall be screwed to solid wood blocking in stud partitions. Install grab bars to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.
- D. Concealed Blocking: Provide concealed wood blocking, 3/4-inch thick plywood covering 32 inch by 32-inch area, in stud walls.

3.3 INSTALLATION OF ANTI-LIGATURE TOILET ACCESSORIES

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing detention toilet accessories to in-place construction.
- B. Apply epoxy security sealant around perimeter in a continuous ribbon on back of detention toilet accessories before installation.
- C. Security Fasteners: Install anti-ligature toilet accessories using security fasteners with head style appropriate for installation requirements, strength, and finish of adjacent materials. Provide stainless-steel security fasteners in stainless-steel materials. Set fasteners in epoxy sealant and after fastener is installed, tool sealant clean and smooth, removing any excess sealant.

3.4 TOILET ACCESSORIES SCHEDULE

- A. Anti-Ligature Toilet Accessories in Single Person Toilet Rooms:
 - 1. Provide frameless mirror over lavatory.
 - 2. Provide one toilet tissue dispenser.
 - 3. Provide one towel hook.
 - 4. Provide one soap dispenser.
 - 5. Provide grab bars in sizes and configurations indicated. Grab bars mounted on steel framed walls shall be screwed to solid wood blocking in stud partitions.

- B. Anti-Ligature Toilet Accessories in Toilet/Shower Rooms:
 - 1. Provide frameless mirror over lavatory.
 - 2. Provide one toilet tissue dispenser.
 - 3. Provide one clothes hook.
 - 4. Provide grab bars in sizes and configurations indicated. Grab bars mounted on steel framed walls shall be screwed to solid wood blocking in stud partitions.

3.5 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.

- B. Remove temporary labels and protective coatings.

- C. Adjust anti-ligature towel and clothes hooks to release with application of 8-lbf load.

- D. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 102800

SECTION 108500 - BUILDING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Reinforced fiberglass wall protection systems.

1.3 SUBMITTALS

- A. General: Submit in accordance with Division 01 Section "Submittal Procedures."
- B. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and method of attachment for each product indicated.

1.4 QUALITY ASSURANCE

- A. Installer's Qualifications: Shall be approved in writing by manufacturer for installation of pistol lockers and shall have a minimum of 5 years of installing products similar to those indicated for this Project.

1.5 WORKMANSHIP

- A. Materials, devices, equipment and apparatus of a patented or of a special nature of manufacture shall be prepared, applied, or installed in strict accordance with the manufacturer's directions.
- B. Work of this Section shall be executed in strict accordance with Drawings, approved Shop Drawings and approved samples.
- C. Insofar as possible, fitting, construction and fabrication of the work shall be executed at shops, ready for delivery and erection at buildings.
- D. Provide all holes, connections, and fastenings for and to work of other trades abutting, adjoining, or intersecting work of this Section.

1.6 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of Contract Documents.

- B. Pistol Lockers: Submit a written warranty, executed by the manufacturer, agreeing to repair or replace components that fail in materials or workmanship within the specified warranty period as follows:
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for manufacturer and product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
 - 2. Product: Subject to compliance with requirements, provide one of the products specified.
- B. Substitutions: Materials shall be as specified herein, except, consideration shall be given to other products that meet or exceed those specified if requested 5 business days prior to the date of bid in accordance with Section 01600 "Product Requirements."
- C. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.2 REINFORCED FIBERGLASS WALL PROTECTION SYSTEM

- A. Reinforced Fiberglass Wall Protection System (FRP): Kemlite Glasboard P with surfaseal, 0.090" x 4 feet x full height panels. PVC inside and outside corners, and 1-inch wide, minimum, H-molding. Use adhesive and caulking as specified by manufacturer. Color for panel and molding shall match.
 - 1. Color: As selected by Architect from manufacturer's full range of colors.
- B. Adhesive: Comply with paneling manufacturer's recommendations for adhesives.

2.3 FABRICATION

- A. General: Materials shall be free from defects impairing strength, durability or appearance.
- B. Sections and shapes shall be rolled, formed, drawn or extruded as required for respective functions.
- C. Fastenings, exposed metal fastenings, and accessories, unless Underwriters' prohibit for safety, shall be of same materials, texture, color and finish as the base metal to which applied.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installers present, for compliance with requirements for installation tolerances, and other conditions affecting performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. All items specified under this Section shall be installed in strict accordance with manufacturer's written instructions and approved Shop Drawings.

3.3 FRP INSTALLATION

- A. Install in accordance with manufacturer's written instructions. Set fiberglass reinforced panel edges in silicone sealant. Perimeter and H-moldings shall be fastened through the wallboard to studs or blocking back-up. Provide continuous cove base molding at the bottom of fiberglass panels, set in sealant. Apply wall panels with adhesive, allowing proper clearance for expansion and contraction. Brace wall panels to assure even contact to wall until adhesive has cured.

3.4 CLEANING AND PROTECTION

- A. Clean building specialties in accordance with manufacturer's instructions. Touch up factory-applied finishes to restore damaged or soiled areas.
- B. Provide final protection and maintain conditions that ensure building specialties are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 108500

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SECTION 123661.16 - SOLID SURFACING COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid surface material countertops.
2. Solid surface material backsplashes.
3. Solid surface material end splashes.
4. Solid surface material apron fronts.
5. Solid surface material sinks.

1.2 ACTION SUBMITTALS

A. Product Data: For countertop materials **and sinks**.

B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.

1. Show locations and details of joints.
2. Show direction of directional pattern, if any.

C. Samples for Initial Selection: For each type of material exposed to view.

D. Samples for Verification: For the following products:

1. Countertop material, **6 inches (150 mm)** square.
2. Wood trim, **8 inches (200 mm)** long.
3. One full-size solid surface material countertop, with front edge **and backsplash, 8 by 10 inches (200 by 250 mm)**, of construction and in configuration specified.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
- B. Installer Qualifications: Fabricator of countertops.

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements before countertop fabrication is complete.

1.7 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ISFA 2-01.
 - 1. Type: Provide Standard type unless Special Purpose type is indicated.
 - 2. Integral Sink Bowls: Comply with CSA B45.5/IAPMO Z124.
 - 3. Colors and Patterns: **As selected by Architect from manufacturer's full range.**
- B. Particleboard: ANSI A208.1, **Grade M-2-Exterior Glue.**

2.2 FABRICATION

- A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WT's "Architectural Woodwork Standards."
 - 1. Grade: **Premium.**
- B. Countertops:
 - 1. **3/4-inch- (19-mm-)** thick, solid surface material **with front edge built up with same material.**
- C. Backsplashes: **3/4-inch- (19-mm-)** thick, solid surface material.
- D. Fabricate tops with shop-applied edges **and backsplashes** unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 - 1. Install integral sink bowls in countertops in the shop.

E. Joints:

1. Fabricate countertops without joints.

F. Cutouts and Holes:

1. Undercounter Plumbing Fixtures: Make cutouts for fixtures using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
 - a. Provide vertical edges, rounded to **3/8-inch (10-mm)** radius at juncture of cutout edges with top surface of countertop, slightly eased at bottom, and projecting **3/16 inch (5 mm)** into fixture opening.
2. Counter-Mounted Plumbing Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.
3. Fittings: Drill countertops in shop for plumbing fittings, undercounter soap dispensers, and similar items.
4. Counter-Mounted Cooktops: Prepare countertops in shop for field cutting openings for cooktops. Mark tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant for Countertops: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install countertops level to a tolerance of **1/8 inch in 8 feet (3 mm in 2.4 m)**, **1/4 inch (6 mm)** maximum. Do not exceed **1/64-inch (0.4-mm)** difference between planes of adjacent units.
- B. Fasten countertops by screwing through corner blocks of base units into underside of countertop. Pre-drill holes for screws as recommended by manufacturer. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

- C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- E. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- F. Install aprons to backing and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears. Fasten by screwing through backing. Pre-drill holes for screws as recommended by manufacturer.
- G. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
 - 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.

END OF SECTION 123661.16

SECTION 230500 – COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Provide labor, materials, accessories, and other related items as required to complete operations in connection with the complete installation of the HVAC and mechanical systems as indicated on the Drawings and as specified herein.

1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract apply to the work, including the work of this Division. Examine Contract Documents for requirements affecting the work.

1.3 DRAWINGS

- A. The general location of the apparatus and the details of the work are indicated on the Drawings. Exact locations not indicated shall be determined at the site as the work progresses and shall be subject to the Architect's approval.
- B. It is not intended that the Drawings shall show every pipe, pipe rise, pipe drop, duct rise, duct drop, pipe fitting, duct fitting, or appliance, but it shall be a requirement to furnish, without additional expense, material and labor necessary to complete the systems in accordance with the design intent and with the highest possible quality available.

1.4 ALTERATIONS

- A. Execute alterations, additions, removals, relocations, new work, and other related items as indicated or required to provide a complete installation in accordance with the intent of the Contract Documents, including changes required by building alterations.
- B. Existing work disturbed or damaged by the alterations or the new work shall be repaired or replaced to the Architect's satisfaction and at no additional cost to the Owner.
- C. Existing ductwork, piping, and other systems indicated to be removed, shall be removed from the site. Cap off existing services remaining. The Owner retains the right to ownership of heating and ventilating equipment scheduled to be removed; store such equipment where requested by the Owner. Material not retained by the Owner shall be removed from the site.

1.5 CONTINUITY OF SERVICE

- A. Arrange to execute the work at such times and in such locations as may be required to provide uninterrupted service for the building or any of its locations. Any unavoidable conditions requiring reduced building capacity shall be arranged for by programming with the Owner's duly authorized representative at the building subject to the Architect's approval. If necessary, temporary work shall be installed to provide for the condition. Authorization for interrupting service shall be obtained in writing from the Owner. Any interruption of normal

service shall be performed during an overtime period to be scheduled with the Owner. Costs for overtime work shall be included in the Bid.

1.6 REQUIREMENTS

- A. Installation Instructions: Obtain manufacturer's printed installation instructions to aid in properly executing work on major pieces of equipment. Install equipment in accordance with manufacturer's recommendations.
- B. Objectionable Noise, Fumes and Vibration:
 - 1. Mechanical and electrical equipment shall operate without creating objectionable noise, fumes, or vibration, as determined by the Architect.
 - 2. If such objectionable noise, fumes, or vibration is produced and transmitted to occupied portions of building by apparatus, piping, ducts, or any other part of mechanical and electrical work, make necessary changes and additions, as approved, without extra cost to Owner.
- C. Equipment Design and Installation:
 - 1. Uniformity: Unless otherwise specified, equipment or material of same type or classification, used for same purposes, shall be product of same manufacturer.
 - 2. Design: Equipment and accessories not specifically described or identified by manufacturer's catalog number shall be designed in conformity with ASME, IEEE, or other applicable technical standards, suitable for maximum working pressure, and with neat and finished appearance.
 - 3. Installation: Erect equipment aligned, level and adjusted for satisfactory operation. Install so that connecting and disconnecting of piping and accessories can be made readily, and so that parts are easily accessible for inspection, operation, maintenance and repair. Minor deviations from indicated arrangements may be made, as approved.
- D. Hanging of Equipment, Ductwork and Piping:
 - 1. Support equipment, ductwork and piping from the top chord of bar joists at the "Panel Points" or from the flange of beams. Piping 2-inch (50 mm) nominal and smaller may be supported from the bottom chord of the bar joists at the "Panel Points".
- E. Protection of Equipment and Materials: Responsibility for care and protection of materials and mechanical work rests with the Contractor until the entire project has been completed, tested, and the project is accepted by the Owner.
- F. Ceiling Mounting: Where ceiling mounting is indicated or specified, use suspended platform or strap hangers, bracket or shelf, whichever is most suitable for equipment and its location. Construct of structural steel members, steel plates, or rods, as required; brace and fasten to building structure or to inserts as approved, or as detailed.

1.7 ACCESS PANELS

- A. Provide access panels in building construction where required for access to duct access doors or other components such as valves, air vents, actuators, volume dampers, motorized dampers in ductwork, duct smoke detectors, and other related items.

1.8 ELECTRIC WORK

- A. Provide motors, pilot lights, controllers, limit switches, and other related items for equipment provided under Division 23.
- B. Except as noted, required line switches, fused switches, and other related items and necessary wiring to properly connect equipment to motors and switches shall be furnished and installed under Division 26, Electric.
- C. Wiring shall conform to the requirements of the National Electrical Code.

1.9 FIRESTOPPING

- A. Firestopping for penetrations of ductwork, piping and equipment through fire rated and smoke rated building assemblies, including but not limited to partitions, walls, floors, ceilings, and roofs, shall be furnished and installed under this Section.
- B. Refer to Architectural Drawings for locations of fire rated building assemblies.

1.10 SUBMITTALS

- A. After award of Contract and before installation, submit for approval Shop Drawings, bulletins, Product Data, Samples, and other related items.
- B. Submit Shop Drawings and Product Data as required in each Section. Submittal shall include physical data and performance data required to verify compliance with the Contract Documents.
- C. Architect/Engineer's review will not include the review, coordination, or verification of dimensions or quantities; these shall be the responsibility of the Contractor.

1.11 SUBSTITUTIONS

- A. Refer to Division 01.

1.12 COORDINATION

- A. Contractor shall coordinate closely with Owner to minimize negative impact on patients. Contractor shall be aware that the facility will be fully operational throughout the construction process and there will be times when there will be occupied patient floors both above and below the floor being renovated. Contractor shall be aware that patients are particularly sensitive to excessive vibration and noise, and shall work to minimize negative impact on patients at all times.
- B. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

- C. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Divisions having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- D. 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; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean-up of work of separate Sections in preparation for Substantial Completion.
- G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.13 CLEANING

- A. Remove debris from site daily.
- B. Material and pieces of equipment shall be turned over to the Owner free of dust and dirt, both inside and out.
- C. At the completion of the Project, equipment shall have a clean, neat appearance of factory finish by cleaning or repainting as required.
- D. At the completion of the Project, surfaces exposed to view shall have a clean, neat appearance of finish free from smudges and scratches by cleaning or repainting as required.

1.14 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect/Engineer 7 days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of responsible manufacturer's representative in accordance with manufacturer's instructions.
- G. When specified in individual Specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or

system installation prior to start-up, and to supervise placing equipment or system in operation.

- H. Submit a written report that equipment or system has been properly installed and is functioning correctly.

1.15 ADJUSTMENTS AND OWNER'S INSTRUCTIONS

- A. After completion of the installation work called for in the Contract Documents, furnish necessary mechanics or engineers for the adjustment and operation of the systems, to the end that the systems are perfectly adjusted and turned over to the Owner in perfect working order. Further instruct the Owner's authorized representative in the care and operation of the installation, providing framed instruction charts, directions, and other related items.
- B. Instructors providing Owner training shall be experienced and familiar with the jobsite.

1.16 TESTING

- A. After the entire installation is completed and ready for operation, test the systems as outlined in Division 23 Section "Testing, Adjusting and Balancing for HVAC." These tests are supplementary to detailed tests specified herein or directed. The Owner will provide water and electric current for the test. Provide necessary labor, test pump, gauges, meters, other instruments, and materials. Perform tests in the presence of the Architect or his representative.
- B. Perform other tests specified in individual Sections of this Specification.

1.17 COMPLETION OF SYSTEMS

- A. The following mechanical systems shall not be complete until the following conditions are satisfied:
 - 1. Ductwork Systems:
 - a. Ductwork and related components and accessories shall be completely installed and insulated as specified.
 - b. Ductwork leakage testing shall be completed and leakage testing reports shall be submitted and approved.
 - c. Ductwork shall be balanced and a balancing report shall be submitted and approved.

1.18 OPERATING AND MAINTENANCE MANUALS

- A. Refer to Division 01.

1.19 WARRANTY

- A. Provide guarantees and warranties for work under this Contract as indicated in the general requirements of the Contract.
- B. Provide manufacturers' standard warranties and guarantees for work by the mechanical trades. However, such warranties and guarantees shall be in addition to and not in lieu of

other liabilities which the manufacturer and the Mechanical Contractor may have by law or by other provisions of the Contract Documents.

- C. Guarantee that elements of the systems provided under this Contract are of sufficient capacity to meet the specified performance requirements as set forth in these Specifications or as indicated on the Drawings.
- D. Upon receipt of notice from the Owner of failure of any part of the mechanical systems or equipment during the warranty period, the Mechanical Subcontractor shall replace the affected part or parts.
- E. Furnish a written guarantee covering the above requirements before submitting the application for final payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 230500

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Testing, Adjustment, and Balancing of Air Systems.

1.2 RELATED SECTIONS

- A. Division 01 Section: Testing laboratory services: Employment of testing agency and payment for services.

1.3 REFERENCES

- A. AABC - National Standards for Total System Balance.
- B. ADC - Test Code for Grilles, Registers, and Diffusers.
- C. ASHRAE 111 - Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-conditioning, and Refrigeration Systems.
- D. NEBB - Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems.
- E. SMACNA - HVAC Systems Testing, Adjusting, and Balancing.

1.4 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers.
- C. NEBB: National Environmental Balancing Bureau.
- D. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.
- E. TAB: Testing, Adjusting, and Balancing.

1.5 SUBMITTALS

- A. Submit under provisions of Division 01.
- B. Submit name of TAB Agency for approval within 14 days after award of Contract.
- C. Design Review Reports:
 - 1. Review the Contract Documents, and indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

- D. Field Reports: Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect/Engineer and for inclusion in operating and maintenance manuals.
- E. Provide reports in letter size, 3-ring binder manuals, complete with index page and indexing tabs, with cover identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.
- F. Include detailed procedures, agenda, sample report forms and copy of AABC National Project Performance Guaranty prior to commencing system balance.
- G. Test Reports: Indicate data on AABC National Standards for Total System Balance forms, forms prepared following ASHRAE 111, NEBB forms, or forms containing information indicated in Schedules.

1.6 QUALITY ASSURANCE

- A. Perform total system balance in accordance with AABC National Standards for Field Measurement and Instrumentation, Total System Balance, ASHRAE 111, or NEBB Procedural Standards for Testing, Balancing and Adjusting of Environmental Systems.

1.7 QUALIFICATIONS

- A. Agency: Company specializing in the testing, adjusting, and balancing of systems specified in this Section with minimum three years' experience
- B. Perform Work under supervision of a registered Professional Engineer experienced in performance of this Work and licensed in Maine.
- C. The approved Agency shall be in no way affiliated with the installing Subcontractor.

1.8 SEQUENCING

- A. Sequence work under the provisions of Division 01.
- B. Sequence work to commence after completion of systems or portions of work, and schedule completion of work before Substantial Completion of Project.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 AGENCIES

- A. Tekon Technical Consultants, Rochester, NH. Contact: Charles Corlin, (603) 335-3080.
- B. Whitetail Air Balance LLC, Lisbon, ME. Contact: Jim Davis, (207) 577-9292.

- C. Air Solutions, Auburn, NH, Contact: Jeremy Reid, (603) 262-9292
- D. Thomas-Young Associates, Inc., Marion, MA. Tel. (508) 748-0204.
- E. Leonhardt Company Inc., Wellesley, MA. Tel. (781) 237-7200.
- F. Hood T.A.B. LLC, Andover, MA. Contact: Michael Hood, (978) 474-7595.
- G. NETB Associates LLC, East Kingston, NH. Contact: Frank Collamore, (978) 270-7547.
- H. H&S Associates, Rochester, NH. Contact: Harry Wiggin, 603-742-2456.
- I. Advantage Engineering, 19 Technology Way, Nashua, NH. Contact: Kevin LaPlante 603-731-3880
- J. Approved equal..

3.2 EXAMINATION

- A. Verify that systems are complete and operating correctly in accordance with sequence of operations before commencing work. Ensure the following conditions:
 1. Systems are started and operating in a safe and normal condition.
 2. Duct systems are clean of debris.
 3. Smoke and volume dampers are in place and open.
 4. Air coil fins are cleaned and combed.
 5. Access doors are closed and duct end caps are in place.
 6. Air outlets are installed and connected.
 7. Hydronic systems are flushed, filled, and vented.
 8. Proper strainer baskets are clean and in place.
 9. Service and balance valves are open.
- B. Submit field reports. Report to the responsible Subcontractors, defects and deficiencies noted during performance of services which prevent system balance. Submit list of locations where the Contractor needs to provide additional balancing devices.
- C. Beginning of work means acceptance of existing conditions.

3.3 PREPARATION

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

3.4 INSTALLATION TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
- B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

- C. Hydronic Systems: Adjust to within plus or minus 10 percent of design.

3.5 ADJUSTING

- A. Ensure recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings

3.6 AIR SYSTEM PROCEDURE

- A. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
- B. Measure air quantities at air inlets and outlets.
- C. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
- D. Use volume control devices to regulate air quantities only to extent that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
- E. Provide system schematic (in floor-plan or line-diagram view) with outlets and inlets numbered with the reference numbers used in the TAB Agent's tabular data, and with required and actual air quantities recorded at each outlet or inlet.
 - 1. Indicate locations of duct traverses.
 - 2. Indicate locations of duct pressure sensors, airflow monitoring stations, and other devices which require measurements for control settings.
- F. Set pattern-control vanes and other devices in air inlets and outlets to provide the spread and throw patterns indicated, without objectionable noise or air motion to the occupants. Split the flow of linear slot diffusers in directions as required for good coverage. At completion, patterns shall be uniform and pleasing to the eye.

3.7 SCHEDULES

- A. Equipment:
 - 1. Air Inlets and Outlets
- B. Report Forms:
 - 1. Title Page:
 - a. Name of Testing, Adjusting, and Balancing Agency
 - b. Address of Testing, Adjusting, and Balancing Agency
 - c. Telephone number of Testing, Adjusting, and Balancing Agency
 - d. Project name
 - e. Project location
 - f. Project Architect
 - g. Project Engineer
 - h. Project Contractor
 - i. Project altitude

- j. Report date
- 2. Summary Comments:
 - a. Design versus final performance
 - b. Notable characteristics of system
 - c. Description of systems operation sequence
 - d. Summary of outdoor and exhaust flows to indicate amount of building pressurization
 - e. Nomenclature used throughout report
 - f. Test conditions
- 3. Instrument List:
 - a. Instrument
 - b. Manufacturer
 - c. Model number
 - d. Serial number
 - e. Range
 - f. Calibration date
- 4. Duct Traverse:
 - a. System zone/branch
 - b. Duct size
 - c. Area
 - d. Design velocity
 - e. Design air flow
 - f. Test velocity
 - g. Test air flow
 - h. Duct static pressure
 - i. Air temperature
 - j. Air correction factor
- 5. Terminal Unit Data:
 - a. Manufacturer
 - b. Type, constant, variable, single, dual duct
 - c. Identification/number
 - d. Location
 - e. Model number
 - f. Size
 - g. Minimum static pressure
 - h. Minimum design air flow
 - i. Minimum actual air flow
 - j. Maximum design air flow
 - k. Maximum actual air flow
 - l. Inlet static pressure

6. Air Distribution Test Sheet:
 - a. Air terminal number
 - b. Room number/location
 - c. Terminal type
 - d. Terminal size
 - e. Area factor
 - f. Design velocity
 - g. Design air flow
 - h. Test (final) velocity
 - i. Test (final) air flow
 - j. Percent of design air flow

END OF SECTION 230593

SECTION 233113 – METAL DUCTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Metal Ductwork.
 - 1. Low pressure.

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Division 26 – Electrical: Smoke detectors.

1.3 RELATED SECTIONS

- A. Division 23 Section “Testing, Adjusting and Balancing for HVAC.”
- B. Division 23 Section “Duct Insulation”: External insulation and duct liner.
- C. Division 23 Section “Air Duct Accessories”
- D. Division 23 Section “Air Outlets and Inlets.”

1.4 REFERENCES

- A. ASTM A 36 - Structural Steel.
- B. ASTM A 90 - Standard Test Method for Weight of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.
- C. ASTM A 167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- D. ASTM A 480 - General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
- E. ASTM A 568 - Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
- F. ASTM A 653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- G. ASTM A 1008 - Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- H. ASTM A 1011 - Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- I. ASTM B 209 - Aluminum and Aluminum-Alloy Sheet and Plate.

- J. ASTM C 14 - Concrete Sewer, Storm Drain, and Culvert Pipe.
- K. ASTM C 443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
- L. AWS D9.1 - Welding of Sheet Metal.
- M. NBS PS 15 - Voluntary Product Standard for Custom Contact-Molded Reinforced-Polyester Chemical Resistant Process Equipment.
- N. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.
- O. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems.
- P. NFPA 91 - Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal or Conveying.
- Q. NFPA 96 - Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment.
- R. SMACNA - HVAC Air Duct Leakage Test Manual.
- S. SMACNA - HVAC Duct Construction Standards - Metal and Flexible (SMACNA HVACDCS).
- T. SMACNA - Fibrous Glass Duct Construction Standards.
- U. UL 181 - Factory-Made Air Ducts and Connectors.
- V. UL 2221 - Tests of Fire Resistive Grease Duct Enclosure Assemblies.

1.5 PERFORMANCE REQUIREMENTS

- A. No variation of duct configuration or sizes is permitted except by written permission from the Architect. Size proposed substitutions of round ducts in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.6 SUBMITTALS

- A. Submit under provisions of Division 01.
- B. Shop Drawings: Indicate duct fittings, particulars such as gauges, sizes, welds, and configuration. Submit prior to start of work.
- C. Product Data: Provide data for duct materials, duct liner and duct connectors.
- D. Test Reports: Submit testing apparatus, procedures, and preliminary forms prior to performing tests. On final reports, indicate pressure tests performed. Include date, section tested, test pressure, and leakage rate, following SMACNA HVAC Air Duct Leakage Test Manual.

1.7 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Division 01.
- B. Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Indicate additional fittings used.

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with SMACNA HVACDCS.

1.9 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this Section with minimum 3 years' experience.
- B. Installer: Company specializing in performing the work of this Section with minimum 3 years' experience.

1.10 REGULATORY REQUIREMENTS

- A. Construct ductwork to NFPA 90A, NFPA 90B and NFPA 96 standards.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
- B. Maintain temperatures during and after installation of duct sealants.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Flexible Ducts:
 - 1. Flexible Technologies Group - Thermaflex product line.
 - 2. Buckley Associates - Flexmaster Triple-Lock Buck Duct product line.
 - 3. No substitutions.
- B. Plastic Drawbands:
 - 1. Panduit.
 - 2. Thomas and Betts.
 - 3. Tyton.
- C. Tape for Flexible Ducts:
 - 1. Ideal Tape Co., division of American Biltrite Inc.
 - 2. 3M Company.
 - 3. Nashua Tape Products, division of Berry Plastics Corp.

4. Venture Tape Corporation.
5. No substitutions.

D. Manufactured Ductwork - Round and Flat Oval:

1. McGill AirFlow LLC, a subsidiary of United McGill Corporation.
2. Aero Heating & Ventilating, Inc.; Portland, ME.
3. Air Purchases, Inc.; Manchester, NH – spiral duct lengths.
4. Atlantic Air Products LLC; Bow, NH.
5. Central City Sheet Metal; Brewer, Caribou, and Gorham, ME.
6. Hahnel Brothers; Bangor and Lewiston, ME.
7. Hranec Corporation; Uniontown, PA.
8. Lindab, Inc. – duct fittings only.
9. Macy Industries, Inc.; Hookset, NH.
10. Monroe Metal Mfg. Inc.; Monroe, NC.
11. Northeastern Sheet Metal Inc.; Goffstown, NH.
12. Semco Inc., division of the Flakt Woods Group.
13. S.G. Torrice Co.; Wilmington, MA – spiral duct lengths.
14. Sheet Metal Connectors Inc.; Minneapolis, MN.
15. Spiral Manufacturing Co. Inc.; Minneapolis, MN.
16. Total Air Supply; Nashua, NH – spiral duct lengths.
17. No substitutions.

E. Manufactured Ductwork - Transverse Duct Connection System:

1. Ductmate.
2. HFC Enterprises; Baldwin Park, CA – Dura Flange product line, for round and flat oval ducts only.

F. Sealants:

1. Hardcast, a division of Carlisle Corporation.
2. 3M Company.
3. Ductmate.
4. Foster.
5. McGill AirSeal LLC, a subsidiary of United McGill Corporation.
6. Mon-Eco Industries, Inc - Eco product line.
7. Polymer Adhesive Sealant Systems.

2.2 MATERIALS

A. Galvanized Steel Ducts:

1. Steel sheet metal components of galvanized ductwork in this Specification Section shall be galvanized steel sheet, lock-forming quality, having G60 or heavier zinc coating (G90 minimum for outdoor or moist applications) conforming to ASTM A653 rating system and tested in accordance with ASTM A90.
2. Provide paint-grip exterior surfaces for exposed ducts, where available.
3. Sheet metal gauge shall be not less than 26 gauge (0.56 mm).

B. Aluminum Ducts: ASTM B209; aluminum sheet, alloy 3003-H14. Aluminum Connectors and Bar Stock: Alloy 6061-T6 or of equivalent strength.

2.3 FLEXIBLE DUCTS

A. Insulated Flexible Ducts:

1. Semi-Rigid Flexible Aluminum Ductwork:
 - a. Flexmaster Triple-Lock Buck Duct - Insulated.
 - b. Triple lock mechanical joint aluminum flex duct, constructed entirely without the use of adhesive.
 - c. Fiberglass insulation and fire-retardant polyethylene vapor retarder film.
 - d. Pressure Rating: Positive pressure 12 in. WG (2988 Pa) for all sizes. Negative pressure 12 in. WG (2988 Pa) for sizes thru 16 in. (406 mm) diameter, 8 in. WG (1993 Pa) for sizes 18 and 20 in. (457 and 508 mm) diameter.
 - e. Maximum Velocity: 5500 fpm (27.9 m/sec).
 - f. Inside bend radius: Minimum one diameter.
 - g. Temperature Range: -40 to 250 degrees F (-40 to 121 degrees C).
 - h. UL 181, Class 0 air duct.
 - i. Meets NFPA 90A and 90B standards.
2. Fabric-Core Flexible Ductwork:
 - a. Thermaflex Model M-KC.
 - b. Greenguard certified.
 - c. UL 181, Class 1, heavy fiberglass cloth fabric supported by helically wound spring steel wire; fiberglass insulation; reinforced metalized vapor barrier film.
 - d. Pressure Rating: 10 inches WG (2.5 kPa) positive and 2.0 inches WG (500 Pa) negative.
 - e. Maximum Velocity: 6000 fpm (30.4 m/sec).
 - f. Temperature Range: -20 to 250 degrees F (-28 to 121 degrees C).

B. Non-Insulated Flexible Ducts:

1. Semi-Rigid Flexible Aluminum Ductwork:
 - a. Flexmaster Triple-Lock Buck Duct - Bare.
 - b. Triple lock mechanical joint aluminum flex duct, constructed entirely without the use of adhesive.
 - c. Pressure Rating: 12 inches WG (2988 Pa) positive for all sizes, 12 inches WG (2988 Pa) negative for sizes thru 16 in. diameter (406 mm), 8 inches WG (1992 Pa) negative for sizes 18 in. (457 mm) and 20 in. (508 mm) diameter.
 - d. Maximum Velocity: 5500 fpm (27.9 m/sec).
 - e. Inside bend radius: Minimum one diameter.
 - f. Temperature Range: -40 to 250 degrees F (-40 to 121 degrees C).
 - g. UL 181, Class 0 air duct.
 - h. Meets NFPA 90A and 90B standards.

- C. Return and Exhaust: Use either semi-rigid flexible aluminum type (insulated or bare), or fabric-core type (insulated). Non-insulated fabric-core type does not have adequate negative pressure rating.

2.4 ACCESSORIES

A. Drawbands for Flexible Ducts:

1. Stainless Steel: ½ inch (13 mm) wide with screw-driven worm gear.
2. Plastic: Panduit PLT5H or PLT8H; Thomas and Betts Dukt-Rap, VAL-26-50, or VAL-275X-25; or Tyton T150L or LX. Install with manufacturer's lever-action tightening tool.

- B. Tape for Flexible Ducts: Ideal-Seal 587A/B, UL 181B-FX listed, aluminum foil with pressure-sensitive acrylic adhesive, -20 to 250 degrees F (-28 to 121 degrees C) temperature range, 25.0 lb/in. width (109.4 N/25.4 mm width) tensile strength.
- C. Fasteners: Rivets, bolts, or sheet metal screws.
- D. Sealants: See Duct Sealant portion of this Specification.
- E. Hanger Rod: ASTM A36; galvanized steel; threaded both ends, threaded one end, or continuously threaded.

2.5 DUCTWORK FABRICATION

- A. Fabricate and support in accordance with SMACNA HVACDCS, as specified or as indicated on the drawings. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.
- B. SMACNA Duct Construction Manuals:
 - 1. The SMACNA recommendations shall be considered as mandatory requirements.
 - 2. Substitute the word "shall" for the word "should" in these manuals.
 - 3. Where the Contract Specifications differ from SMACNA recommendations, the more stringent requirements (as determined by the Architect) shall take precedence.
 - 4. Details on the Contract Drawings take precedence over SMACNA standards.
- C. Sheet metal shall be galvanized steel as specified in Part 2 paragraph "Materials" in this Section, unless otherwise indicated or specified.
- D. Construct Tees, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline.
 - 1. Where space is too restricted for full-radius elbows, provide mitered (square-throat) elbows with single wall turning vanes. Do not use air foil turning vanes.
 - 2. Mitered elbows in round or flat-oval ductwork shall be factory-manufactured.
 - 3. Radiused elbows with throat radius 1/2 times width of duct (centerline radius 1 width of duct) may be used instead of mitered elbows, but only where space is too restricted for full radius.
 - 4. Fittings not conforming to these requirements will be ordered removed and replaced with proper fittings.
- E. Increase duct sizes gradually, not exceeding 15 degrees divergence or convergence (per side) wherever possible; maximum 30 degrees divergence (per side) upstream of equipment and 45 degrees convergence (per side) downstream.
- F. Fabricate continuously welded round and oval duct fittings two gauges heavier than duct gauges indicated in SMACNA Standard. Joints shall be minimum 4 inch (100 mm) cemented slip joint, brazed or electric welded. Prime coat welded joints.
- G. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

- H. Longitudinal locks or seams known as “button-punch-snap-lock” and other “snap-lock” types will not be permitted in rectangular duct. Snap-lock longitudinal seams may be used on round ducts up to 8 inches diameter, with screws provided to secure the seams at 24 inches (609 mm) on center maximum spacing.

2.6 MANUFACTURED DUCTWORK AND FITTINGS

- A. Manufactured ductwork and fittings listed below are acceptable alternatives to standard ductwork systems. For exposed round and flat oval ductwork, factory-manufactured ductwork and fittings are required.
- B. Manufacture in accordance with SMACNA HVACDCS, and as specified or as indicated on the drawings. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.
- C. Galvanized and stainless steel sheet metal used in fabrication shall be not less than 26 gauge (0.551 mm) thickness. Aluminum shall be not less than 0.025 in. (0.635 mm) nominal thickness. This requirement supersedes SMACNA requirements.
- D. Round and Flat Oval Duct and Fittings:
 - 1. Shall be suitable for at least 4 in. WG (996 Pa) positive pressure and 2 in. WG (498 Pa) negative pressure in accordance with SMACNA HVACDCS standards. This is a minimum; provide higher ratings where required.
 - 2. Fittings shall be fabricated of sheet metal at least one gauge heavier than straight duct of the same size.
 - 3. Fittings shall be factory-sealed so that no field sealing of joints between gores or segments is required. Acceptable methods of construction are fully welded, spot-welded with inner sealant, or standing-seam crimped joints.
- E. Radiused Elbows in Round and Flat Oval:
 - 1. In exposed ductwork shall be non-adjustable type, factory-sealed.
 - 2. In concealed ductwork may be adjustable type, with full long radius as detailed on the Drawings. Short-radius elbows are not allowed.
 - 3. Shall be constructed of the following minimum number of segments or gores: 90-degree: 4 gores; 60-degree: 3 gores; 45-degree: 3 gores; 30-degree: 2 gores; 22-1/2-degree: 2 gores.
 - 4. 1-piece stamped elbows are acceptable up to 12 inches (305 mm) diameter. Pleated elbows are acceptable up to 10 inches (254 mm) diameter.
- F. Mitered Elbows in Round and Flat Oval:
 - 1. Available in both 90-degree and 45-degree elbows.
 - 2. Shall have minimum number of welded single-wall vanes as follows (size is duct width in plane of bend):
 - a. 3 to 9 inch (76 to 229 mm): 2.
 - b. 10 to 14 inch (254 to 356 mm): 3.
 - c. 15 to 19 inch (381 to 483 mm): 4.
 - d. 20 to 60 inch (508 to 1524 mm): 5.
 - e. Larger Sizes: 12-inch (305 mm) maximum spacing.
- G. Inner tie-rod reinforcement is not allowed. Increase duct sheet metal gauge or external reinforcement as required.

- H. Flat Oval Ducts: Machine made from round spiral lockseam duct.
- I. Double Wall Insulated Round Ducts: Round spiral lockseam duct with galvanized steel outer wall, 1 inch (25 mm) thick fiberglass insulation, perforated galvanized steel inner wall; fittings with solid inner wall.
- J. Transverse Duct Connection System: SMACNA "F" rated or SMACNA "J" rated rigidity class connection, interlocking angle and duct edge connection system with sealant, gasket, cleats, and corner clips. Product shall be Ductmate factory-manufactured connectors, or field-formed flanges using a specialized machine.

2.7 PRESSURE CLASSIFICATION

- A. Ratings as indicated on the Drawings or as specified. See Ductwork Pressure Class Schedule in Part 3 of this Section.
- B. If no ratings are indicated, ductwork shall be rated for the external static pressure of the system plus 25 percent.
 - 1. If 4 dampers (of any type) or fewer can isolate a duct system, that portion of the system shall be rated for the shut-off pressure of the system fans.

2.8 DUCT SEALING

- A. Seal ductwork as outlined in the SMACNA HVACDCS. Seal ductwork to a minimum of class A (transverse joints, longitudinal seams, and duct wall penetrations), regardless of pressure class.
- B. Seal ductwork systems as required to ensure that maximum duct leakage does not exceed that allowed by the latest edition of the SMACNA HVAC Air Duct Leakage Test Manual. Allow sealant to dry in accordance with manufacturer's requirements of time and environmental conditions before ductwork systems are pressurized.
- C. Duct sealing materials used shall be non-flammable and non-combustible in both liquid and solid states.
- D. Seal Pittsburgh hammered lockseams by flooding the joint with sealant prior to assembly.
- E. Seal exposed ducts by applying mastic-type or gasket-type sealer just before the joint or seam is made; remove excess sealant for a neat appearance.
- F. Fill (with matching duct material such as sheet metal) any gaps in duct which exceed the recommendations of the sealant manufacturer, and in no case shall liquid or mastic sealant be used to fill gaps or openings which exceed 1/8 inch (3.2 mm) in any direction. Verify that system air pressure acting on a wide gap will not exert enough force to damage or loosen the sealant.
- G. Materials for Sealing:
 - 1. Hardcast: Flex-Grip 550 or Iron-Grip 601 mastic.
 - 2. Hardcast: gypsum-based tape and mastic, waterproof type when used on moist-air exhaust or in humid or outdoor locations.

3. Ductmate: Flanged lateral joints with gaskets.
4. Ductmate: PROseal.
5. Foster: Duct-Fas or Safetee mastic sealant. Duct-Fas is UV resistant and recommended for applications exposed to sunlight.
6. Mon-Eco: Eco-Duct Seal 4450 (red color) or 4452 (grey color). Use grey color where ducts will be unpainted and exposed to public view.
7. Polymer Adhesives Sealant Systems: Airseal No. 11 premium sealant.

2.9 UNIFORMITY OF MATERIALS

- A. Ductwork accessories, including but not limited to volume dampers, smoke dampers, fire dampers, combination fire/smoke dampers, backdraft dampers and motorized dampers, shall be fabricated of materials that are similar to the ductwork in which they are installed.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components furnished under other Section and Divisions of the Specifications. Such items may include but are not limited to: Sensors and airflow measuring stations furnished under Division 23 Section "Instrumentation and Control for Mechanical Systems"; gauges and meters; and smoke detectors furnished under Division 26 – Electrical.
- C. Install ducts in accordance with SMACNA HVACDCS.
- D. Duct Sizes are inside clear dimensions. For lined ducts, maintain sizes inside lining.
- E. "Fishmouth" duct connections are not allowed.
- F. Inner tie-rod reinforcement is not allowed. Increase duct sheet metal gauge or external reinforcement as required.
- G. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pitot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
- H. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
- I. Use crimp joints with or without bead for joining round duct sizes 8 inch (200 mm) and smaller with crimp in direction of air flow.
- J. Use double nuts and lock washers on threaded rod supports. Strap hangers shall be minimum 16 gauge (1.50 mm) x 1 inch (25 mm) galvanized straps. Hanger and support components including but not limited to "unistrut" shall be galvanized steel except that where other duct materials are used, the hanger materials shall be compatible and non-corrosive to the duct. Wire hangers are not acceptable.

- K. Flexible Ducts:
1. Connect diffusers or light troffer boots to low pressure supply ducts directly or with 5 feet (1.5 m) maximum length of flexible duct held in place with strap or clamp.
 2. Minimum bend radius shall be one and one half times the duct diameter. Support the bend to maintain this radius.
 3. Bends shall not exceed 45 degrees.
 4. Connect flexible ducts to metal ducts with 2 turns of duct tape and metal draw bands. Plastic drawbands may be used if they are installed using the band manufacturer's lever-action tightening tool. On insulated flexible ducts, provide an additional seal of tape and drawband on the insulation's vapor barrier.
- L. During construction, provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system. Do not start ducted air moving equipment until construction is completed to a stage where airborne construction dust is no longer present. At the time of substantial completion, the entire air distribution system shall be turned over to the Owner clear of construction dust and debris. If the interior surfaces of any ducted air moving equipment or the interior surfaces of any portion of the ductwork distribution system are found, as determined by the Architect, to contain significant construction dust and debris, the entire air distribution system shall be cleaned in accordance with Division 23. If proper precautions are taken to prevent construction dust and debris from entering the ductwork during construction and if the Architect finds all ductwork to be free from such dust and debris, air duct cleaning shall not be required.
- M. Install duct-mounted components furnished under other Sections of this Specification, such as smoke dampers, control dampers, control sensors, and smoke detectors. Install with straight lengths of duct as required for proper operation. Provide access at such components as required. Install in accessible locations for maintenance; notify the Architect if a location indicated or selected requires addition of access by other trades.
- N. Leakage Class Schedule:

| DUCT TYPE | LEAKAGE CLASS |
|-------------------|---------------|
| Rectangular Metal | 6 |
| Round Metal | 3 |

3.2 SCHEDULES

- A. Ductwork Material Schedule

| AIR SYSTEM | MATERIAL |
|-------------------------|----------------------------|
| Supply, Return, Exhaust | Galvanized Steel, Aluminum |

END OF SECTION 233113

SECTION 260100 - SHORT FORM ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. The work included under this Section consists of a complete electrical system, as required to accommodate the Dorothea Dix Toilet Room Upgrades project.
- B. Electric Services shall be upgraded as indicated.
 - a. Select lighting fixtures and associated switches shall be replaced with LED fixtures, designed to be ligature resistant and impact resistant. See lighting schedule on drawings for additional information.
 - b. Demolition of existing nurse call associated with toilet rooms and replacement with new call system. See spec section 275223 for Nurse Call System Requirements.
 - c. All fire alarm devices are to remain.
 - d. Select areas will require new fire alarm detection and notification devices to match existing system.
 - e. Existing receptacles in the area of work as well as all other wall mounted devices not mentioned above are existing to remain.

1.2 WORK INCLUDED

1.3 RELATED REQUIREMENTS

- A. Conditions of the Contract and Division 1, General Requirements, apply to all the work, including the work of this Division. Examine all contract documents for requirements affecting the work.
- B. Definitions:
 - a. Communications Jack: A fixed connecting device designed for insertion of a communications cable plug.
 - b. Communications Outlet: One or more communications jacks, or cables and plugs, mounted in a box or ring, with a suitable protective cover.
 - c. Designated Seismic System: A system component that requires design in accordance with ASCE/SEI 7, Ch. 13 and for which the Component Importance Factor is greater than 1.0.
 - d. Direct Buried: Installed underground without encasement in concrete or other protective material.
 - e. Enclosure: The case or housing of an apparatus, or the fence or wall(s) surrounding an installation, to prevent personnel from accidentally contacting energized parts or to protect the equipment from physical damage. Types of enclosures and enclosure covers include the following:
 - a. Cabinet: An enclosure that is designed for either surface mounting or flush mounting and is provided with a frame, mat, or trim in which a swinging door or doors are or can be hung.
 - b. Concrete Box: A box intended for use in poured concrete.
 - c. Conduit Body: A means for providing access to the interior of a conduit or tubing system through one or more removable covers at a junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.
 - d. Conduit Box: A box having threaded openings or knockouts for conduit, EMT, or fittings.
 - e. Cutout Box: An enclosure designed for surface mounting that has swinging doors

- or covers secured directly to and telescoping with the walls of the enclosure.
- f. Device Box: A box with provisions for mounting a wiring device directly to the box.
- g. Extension Ring: A ring intended to extend the sides of an outlet box or device box to increase the box depth, volume, or both.
- h. Floor Box: A box mounted in the floor intended for use with a floor box cover and other components to complete the floor box enclosure.
- i. Floor-Mounted Enclosure: A floor box and floor box cover assembly with means to mount in the floor that is sealed against the entrance of scrub water at the floor level.
- j. Floor Nozzle: An enclosure used on a wiring system, intended primarily as a housing for a receptacle, provided with a means, such as a collar, for surface-mounting on a floor, which may or may not include a stem to support it above the floor level, and is sealed against the entrance of scrub water at the floor level.
- k. Junction Box: A box with a blank cover that joins different runs of raceway or cable and provides space for connection and branching of the enclosed conductors.
- l. Outlet Box: A box that provides access to a wiring system having pryout openings, knockouts, threaded entries, or hubs in either the sides or the back, or both, for the entrance of conduit, conduit or cable fittings, or cables, with provisions for mounting an outlet box cover, but without provisions for mounting a wiring device directly to the box.
- m. Pedestal Floor Box Cover: A floor box cover that, when installed as intended, provides a means for typically vertical or near-vertical mounting of receptacle outlets above the floor's finished surface.
- n. Pull Box: A box with a blank cover that joins different runs of raceway and provides access for pulling or replacing the enclosed cables or conductors.
- o. Raised-Floor Box: A floor box intended for use in raised floors.
- p. Recessed Access Floor Box: A floor box with provisions for mounting wiring devices below the floor surface.
- q. Recessed Access Floor Box Cover: A floor box cover with provisions for passage of cords to recessed wiring devices mounted within a recessed floor box.
- r. Ring: A sleeve, which is not necessarily round, used for positioning a recessed wiring device flush with the plaster, concrete, drywall, or other wall surface.
- s. Ring Cover: A box cover, with raised center portion to accommodate a specific wall or ceiling thickness, for mounting wiring devices or luminaires flush with the surface.
- t. Termination Box: An enclosure designed for installation of termination base assemblies consisting of bus bars, terminal strips, or terminal blocks with provision for wire connectors to accommodate incoming or outgoing conductors, or both.
- f. Emergency Systems: Those systems legally required and classed as emergency by municipal, state, federal, or other codes, or by any governmental agency having jurisdiction that are designed to ensure continuity of lighting, electrical power, or both, to designated areas and equipment in the event of failure of the normal supply for safety to human life.
- g. Essential Electrical Systems: Those systems designed to ensure continuity of electrical power to designated areas and functions of a healthcare facility during disruption of normal power sources, and also to minimize disruption within the internal wiring system. (healthcare facilities)
- h. High-Performance Building: A building that integrates and optimizes on a life-cycle basis all major high-performance attributes, including energy conservation, environment, safety, security, durability, accessibility, cost-benefit, productivity, sustainability, functionality, and operational considerations.
- i. Jacket: A continuous nonmetallic outer covering for conductors or cables.
- j. Luminaire: A complete lighting unit consisting of a light source such as a lamp, together

- with the parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source or the ballast or to distribute the light.
- k. Mode: The terms "Active Mode," "Off Mode," and "Standby Mode" are used as defined in the Energy Independence and Security Act (EISA) of 2007.
 - l. Multi-Outlet Assembly: A type of surface, flush, or freestanding raceway designed to hold conductors, receptacles, and switches, assembled in the field or at the factory.
 - m. Plenum: A compartment or chamber to which one or more air ducts are connected and that forms part of the air distribution system.
 - n. Provide: As used in this section, "provide" shall mean, "Furnish and install". "Furnish" shall mean "to purchase and deliver to the project site complete with every necessary appurtenance and support", and "install" shall mean "to unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project."
 - o. Receptacle: A fixed connecting device arranged for insertion of a power cord plug. Also called a power jack.
 - p. Receptacle Outlet: One or more receptacles mounted in a box with a suitable protective cover.
 - q. Sheath: A continuous metallic covering for conductors or cables.
 - r. UL Category Control Number: An alphabetic or alphanumeric code used to identify product categories covered by UL's Listing, Classification, and Recognition Services.
 - s. Voltage Class: For specified circuits and equipment, voltage classes are defined as follows:
 - a. Control Voltage: Having electromotive force between any two conductors, or between a single conductor and ground, that is supplied from a battery or other Class 2 or Class 3 power-limited source.
 - b. Line Voltage: (1) (controls) Designed to operate using the supplied low-voltage power without transformation. (2) (transmission lines, transformers, SPDs) The line-to-line voltage of the supplying power system.
 - c. Extra-Low Voltage: Not having electromotive force between any two conductors, or between a single conductor and ground, exceeding 30 V(ac rms), 42 V(ac peak), or 60 V(dc).
 - d. Low Voltage: Having electromotive force between any two conductors, or between a single conductor and ground, that is rated above 30 V but not exceeding 1000 V.
 - e. Medium Voltage: Having electromotive force between any two conductors, or between a single conductor and ground, that is rated about 1 kV but not exceeding 69 kV.
 - f. High Voltage: (1) (circuits) Having electromotive force between any two conductors, or between a single conductor and ground, that is rated above 69 kV but not exceeding 230 kV. (2) (safety) Having sufficient electromotive force to inflict bodily harm or injury.

1.4 GENERAL REQUIREMENTS

- A. The work covered by these specifications consists of furnishing all labor, equipment, materials, supplies, etc. as necessary for a complete operating electrical system as shown on the plans. Responsibilities for cutting, patching, channeling and chasing shall be as defined in the construction documents.
- B. All work shall be in accordance with the current edition of the National Electric Code (NEC), NFPA, applicable state building code, and any other local requirements that may apply. Contractor shall pay for all required permits, fees, inspections, etc.
- C. The drawings are diagrammatic and are not intended to show each and every conductor, fitting, device, conduit, or a complete detail of all the work to be performed, but are for the purpose of illustrating the type system and special conditions necessary for the experienced electrician to

take off his material and lay out his work. The contractor shall be responsible for making such measurements as may be necessary at the project and adapting his work to the project conditions.

- D. Adequate housing shall be provided for all materials stored on the job site. Only conduit may be stored outside, but it shall be protected from the weather.
- E. Upon completion of work, contractor shall present owner with a certificate of approval from the local inspector.
- F. All work shall be guaranteed, in accordance with the contract requirements, for a period of one year after acceptance by the owner. Any imperfect materials or workmanship shall be replaced without additional cost to the owner.
- G. Each bidder shall visit the job site prior to bidding to familiarize himself with the existing conditions. Failure to visit site shall not excuse the contractor from performing the required work nor shall it be an acceptable reason for requesting additions to the contract.
- H. The existing portions of this facility will remain in operation during this construction. The contractor shall cause as little disruption as possible to the functioning of the facility in order to maintain the comfort and safety of the occupants. Demolition and construction will be required so as not to interfere with facility operations; therefore, all work shall be coordinated with the owner.
- I. This project involves some work on existing electrical facilities. Existing feeders, branch circuits, raceways, etc. which are disrupted by this project shall be rerouted and/or re-fed from a new source as required to maintain them in full and permanent service.
- J. Where penetrations are made through a fire-resistive or smoke wall, floor, or partition, for the purpose of running raceway carrying electrical circuits, the opening around the raceway shall be sealed with a U.L. approved system for the purpose of cutting off drafts and to provide an effective fire and/or smoke stop. Coordination with subcontractors shall be maintained to ensure that this fire/smoke stopping is accomplished.
- K. In required fire rated walls and partitions, openings for installation of boxes that are greater than 16 square inches shall be protected as required by U.L. Coordinate closely with the subcontractors to ensure the integrity of the UL rating is maintained.
- L. All terminations, conductors, and devices shall be 75 degree rated.
- M. All fixed electrical equipment furnished by the contractor shall be listed and labeled by an approved testing agency. Factory assembled listed components shall be listed and labeled as an assembly. Any electrical equipment not listed or labeled must be approved by the local electrical inspector and have a third party testing label.
- N. It is understood that while the construction documents shall be followed as closely as circumstances will permit, the contractor is held responsible for the installation of the system according to the true intent and meaning of the construction documents. Anything not entirely clear in the construction documents will be fully explained if application is made to the architect/engineer in accordance with the general conditions and supplements thereto. However, should conditions arise where, in the judgement of the contractor, certain changes will be advisable, the contractor shall communicate with the architect/engineer and secure his review of these changes before proceeding with the work, provided they are of a major nature.
- O. Drawings shall not be scaled. Refer to architectural and structural drawings for building

construction and dimensions, and to room finish schedule or architectural drawings for material, finish, and construction method of walls, floor, and ceiling, in order to ensure proper rough in and installation of work.

- P. At the contractor's request, electronic files of the electrical construction documents shall be made available in autocad format for the contractor to use on this project. The contractor shall be required to sign an electronic data release form from harriman in order to receive the electronic files. Upon receipt of a \$25 per sheet processing fee, the requested electronic files will be available for the contractor's use.

1.5 SHOP DRAWINGS

- A. The Contractor shall, after award of Contract and before installation, submit Shop Drawings, Owner's Manuals and Operating Instructions for equipment to be furnished under this Contract. Shop Drawings shall be submitted for the following items (Shop Drawings are required prior to acceptance):
 - a. Fire alarm devices.
 - b. Shop Drawings shall show indicating and Initiative device type and location and indicate any device controlled in such cases
 - c. Shop Drawings shall also provide device number, area or room number indicating device label, type and engineering data.
 - d. Submittals and shop drawings shall be provided for all proposed equipment, components, and accessories.
 - e. Relays and lighting contactors.
 - f. Wiring materes.
 - g. Nurse Call systems – to include shop drawings showing device number, area or room number, type, and engineering data.

1.6 RECORD DRAWINGS AND CLOSE OUT

- A. The contractor shall provide one set of marked plans to the architect/engineer for their preparation of record drawings. The plans shall be marked with a red pen and indicate all changes and deviations from the original construction documents. Each change shall be marked in a clear, legible manner, keying it to the appropriate change order, clarification note, or field authorization note, as applicable.
- B. Safety Material Data Sheets (MSDS) must be received prior to project close out.
- C. Instruction manuals shall be provided for all proposed equipment, components, and accessories.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials and equipment shall be new and shall be listed by the Underwriter's Laboratories (U.L.), inc. for the use intended when a standard for such material and use exists. All items of the same type and rating shall be identical and of the same manufacturer.
- B. Submit materials list showing proposed raceway, boxes, wire, etc.
- C. Where "or equivalent as accepted by the architect/engineer" is specifically noted in the specifications, reference to any article, device, product, material, fixture, or type of construction by name, make or catalog number, such reference shall be interpreted only as establishing a standard of quality and shall not be construed as limited competition. The contractor, in such

cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect or Engineer, expressed in writing, is acceptable as equivalent to that specified.

- D. Materials from listed manufacturers shall only be acceptable if they can properly fit in the allocated spaces without interference from building walls, ceilings, piping, conduit, ducts or other equipment.

2.2 RACEWAY

- A. Shall be manufactured by Allied, Triangle, Wheatland, or approved equivalent.
- B. Use EMT for general concealed branch circuiting. MC Cable may be used for final runout wiring to receptacles and light switch devices in wall only. MC cable shall be terminated in junction box above ceiling near device served with homeruns to panel in EMT conduit.
- C. EMT fittings shall be compression gland type, of malleable iron or steel. Connectors shall have insulated throats. Cast, set screw, or indenter type fittings are not acceptable.
- D. All raceway shall be run concealed where possible (i.e., In new walls or above ceilings). All runs shall be neat and square. Obtain approval from owner before running exposed wiring. All exposed conduit shall be painted to match surface.
- E. Minimum conduit size shall be 3/4".
- F. Provide nylon pull strings in all empty conduits.
- G. Use liquidtight flexible conduit for connections to transformers, motors and other vibration producing equipment.
- H. Use flexible metal conduit, maximum 72", for connection to recessed and semi-recessed luminaires.
- I. Use rigid galvanized steel conduit where exposed to outdoor elements or subject to physical damage. Fittings shall be steel compression type. Connectors shall have insulated throats. Cast, set screw, or indenter type. Fittings are not acceptable.
- J. Underground raceway shall be schedule 40 pvc conduit with a separate copper grounding conductor sized in accordance with the NEC. Conduit exposed to the weather shall be IMC type.
- K. All electrical work shall be executed in a neat manner by skilled electricians. Exposed raceways shall be run parallel or perpendicular to structural members, walls, ceilings or floor.
- L. Conduits shall be of sizes required by the national electrical code increased as required to include bonding conductor as specified.
- M. No wire shall be installed until work which might cause damage to wires or conduits has been completed.
- N. Conduits shall be thoroughly cleaned of water or other foreign matter before wire is installed.
- O. Conduits shall be fastened by suitable galvanized clips or approved hangers. Clips and boxes shall be fastened by wood screws on wooden surfaces, machine screws on metal, toggle bolts in masonry block, or by expansions shields in concrete.

- P. Parallel runs of conduit shall be neatly clustered with all bends and offsets of uniform pattern.

2.3 WIRING DEVICES AND PLATES

- A. Manufactured by Hubbell, G.E., Bryant, or approved equal.
- B. Switches shall be 20A, 120/277VAC, specification grade.
- C. Receptacles shall be 20A, 125VAC, specification grade.
- D. Device plates shall be installed with tamperproof screws. Confirm color selection with architect.
- E. Device color selection shall be confirmed by architect. Those connected to emergency power shall be red.
- F. Duplex receptacles shall be safety type that permit current to flow only while a standard plug is in the proper position in the receptacle.
- G. Locate switches close to door frame on latch side of door, or beyond swing of door where appropriate.

2.4 OUTLET BOXES

- A. Shall be as manufactured by Midland Ross/Steel City, Raco, T&B, Appleton, or approved equivalents.
- B. Use no nails. Attach boxes with screws, bolts, caddy bar straps, etc. Secure both sides of flush mounting box to interior wall and partition. Studs. Accurately position to allow for surface finish thickness. Use stamped steel bridges or spanner bars to secure both sides of flush mounting outlet box between studs.
- C. Minimum size shall be 4" square by 1 1/2" deep with plaster rings as required for finishing.
- D. Provide divider for different voltages or branches.
- E. Outlet boxes, fittings, etc. For exterior use shall be cast type "condulet" with gaskets for waterproofing.

2.5 JUNCTION BOXES

- A. Junction boxes shall be standard type galvanized steel minimum size four inch (4") octagon or four inch (4") square 2-1/8" minimum depth, except where noted otherwise.
- B. Provide plaster rings raised up to 1-1/4" on boxes as required.
- C. Junction boxes shall be specially constructed of code gauge galvanized sheet steel where required.
- D. Light outlet boxes are to be provided with drilled and tapped ears to received fixture bars. Use 4-11/16" square boxes where required.

2.6 SUPPORTS

- A. All equipment shall be adequately supported from structure.
- B. Inserts in masonry shall be lead or fiber in drilled holes or cast in place.

- C. Use no nails. Use only screws, bolts, etc.
- D. Raceway shall be supported from structure and properly secured. Supports shall be a maximum of 10' apart and a minimum of 3' from boxes. Do not support raceway from ceiling grid or duct work.
- E. Provide seismic bracing based on the site class and assigned use group. Calculations to support seismic restraints designs must be signed and sealed by a qualified professional engineer registered in project state.

2.7 CONDUCTORS

- A. Shall be manufactured by Rome, American/Leviton, Triangle, or approved equal. All conductors shall be copper.
- B. Wiring shall be 600 Volt, type THHN or THW or type XHHW.
- C. Color code shall match existing or be as required by the NEC.
- D. Wiring within panelboards shall be neat and square, bunched, and tagged.
- E. Wiring shall be copper conductors. Wiring #8 AWG and larger shall be stranded.
- F. Wiring within led fixture housings and between fixtures and junction boxes above ceilings shall be type THHN insulated conductors rated for use at temperatures not lower than 90c.
- G. All exterior exposed wiring shall have threaded cast "condulet" type fittings and boxes for exterior installations shall be weatherproofed.

2.8 WIRING METHOD

- A. No conduit shall contain more than three circuits.
- B. Connect loads to circuits shown.
- C. Ground all equipment per the NEC. Bond where conduits enter enclosures through concentric knockouts.
- D. Equipment grounding conductor: provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
- E. Branch circuit wiring requires a minimum #12 AWG insulated grounding conductor. This conductor may or may not be shown on the drawings.

2.9 EQUIPMENT IDENTIFICATION

- A. Provide nameplates for all electrical equipment including, but not limited to, the following equipment:
 - a. Panelboards
 - b. Individually mounted circuit breakers
 - c. Safety switches
 - d. 1/4 hp and larger motors
 - e. HVAC equipment
- B. Nameplates shall be engraved, laminated micarta. Plates up to 8 square inches shall not be less

than 1/16" thick material; larger than 8 square inches not less than 1 1/8" thick. Letter and background colors shall be as follows (unless directed otherwise by the owner):

- a. Normal: White letters on black background.
- b. Life safety: White letters on red background.
- c. Standby/Emergency - Fed from gen: Black letters on orange background.

C. Engraving shall be condensed gothic type, 1/4" minimum height.

D. Nameplates shall be attached with two-sided adhesive tape.

2.10 GROUNDING

A. The power distribution system shall be grounded at each voltage level. The conduit and neutral conductors of the wiring systems and all electrical equipment shall be grounded. The ground connection of the electrical system neutral and conduit system shall be made at the main service switchboard or main power device.

B. Each conductive, non-current carrying, part of the electrical system shall be bonded to an equipment grounding conductor sized in accordance with the NEC.

C. Where a metal underground water pipe is the only available electrode, it shall be supplemented by made electrodes.

D. Grounding continuity between the grounding circuit of a receptacle and its grounded outlet box shall be established by means of a bonding jumper between the outlet box and the receptacle grounding terminal.

2.11 QUALITY ASSURANCE

A. Electrical components, devices, and accessories: listed and labeled as defined in NFPA 70, article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.12 CONDUCTORS

A. Insulated conductors: copper wire or cable insulated for 600 V unless otherwise required by applicable code or authorities having jurisdiction.

B. Bare copper conductors:

- a. Solid conductors: ASTM B 3.
- b. Stranded conductors: ASTM B 8.

C. Grounding bus: Rectangular bars of annealed copper, 1/4 by 2 inches (6 by 50 mm) in cross section, unless otherwise indicated; with insulators.

2.13 CONNECTORS

A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted connectors for conductors and pipes: copper or copper alloy, bolted pressure-type, with at least two bolts.

- C. Pipe connectors: clamp type, sized for pipe.
- D. Welded connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.14 APPLICATIONS

- A. Conductors: install solid conductor for no. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated. Isolated grounding conductors: green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.
- B. Conductor terminations and connections:
 - a. Pipe and equipment grounding conductor terminations: bolted connectors.
 - b. Connections to structural steel: welded connectors.

2.15 INSTALLATION

- A. Grounding conductors: route along shortest and straightest paths possible, unless otherwise indicated or required by code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Bonding straps and jumpers: install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 - a. Bonding to structure: bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - b. Bonding to equipment mounted on vibration isolation hangers and supports: install so vibration is not transmitted to rigidly mounted equipment.
 - c. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

2.16 FIELD QUALITY CONTROL

- A. Report measured ground resistances that exceed the following values:
 - a. Power and lighting equipment or system with capacity 500 KVA and less: 10 Ohms.
 - b. Power distribution units or panelboards serving electronic equipment: 3 Ohm(s).
- B. Excessive ground resistance: if resistance to ground exceeds specified values, notify architect promptly and include recommendations to reduce ground resistance.

2.17 ELECTRICAL CONNECTIONS

- A. The electrical contractor shall provide power wiring and final electrical connection to all equipment requiring electrical power.
- B. Control wiring for equipment not provided under this section, unless specifically called for on the electrical drawings, will be provided by the respective equipment contractor.
- C. Final equipment connection shall be the responsibility of this contractor. Final connection to HVAC units shall be accomplished via flexible metallic conduit suitable for the application.
- D. The electrical contractor shall provide full and final connection to all equipment furnished by owner requiring electrical connections.

2.18 CIRCUIT BREAKERS

- A. Circuit breakers to be added to existing panelboards shall match the existing panelboard circuit breakers.

2.19 FUSES

- A. Dual Element time delay type RK-1 Buss Fusetron or approved equal.

2.20 DISCONNECT SWITCHES

- A. Fused and unfused disconnect switches shall be enclosed, heavy duty type, except as noted. Switches shall have visible blades and shall have NEMA-1 enclosure, 600-volt and 250-volt ratings as required by the particular circuit with fuses and ampere rating and number of poles as indicated on Drawings, or as required by the specific equipment. Where required for exterior use, switches shall be NEMA-3R rain tight.
- B. Fuses for all fuse clips, plugs, etc., shall be provided and one (1) spare set delivered to Owner. A duplicate set of spare fuses shall be delivered to Owner and a receipt shall be delivered to the Architect with the request for final payment. Fuses shall be Bussman or Chase Shawmut.
- C. Disconnect switches shall be as manufactured by ITE Siemens, Square-D, Cutler Hammer, or General Electric.

2.21 FIRE ALARM SYSTEM

- A. System Description: Fire alarm components shall be as manufactured by Notifier. Provisions shall be made for new fire alarm components, devices and appliances to be integrated into the existing fire alarm system. The integrated system including equipment, components, and all accessories shall be UL listed for the purpose for which the devices are used.
- B. All new devices shall be fully compatible with the existing system.
- C. All work shall be installed in accordance with National Electrical Code, National Fire Protection Association, Standards 72 and also all applicable Federal, State and local codes.
- D. Conductors for initiating, notification, and annunciation devices shall be sized and installed per manufacturers recommendations. All associated wiring shall be in minimum ¾" conduit with all loop wiring marked at all terminations for identification on associated prints and as outlined by NFPA-70 and NEC.
- E. All fire alarm circuits shall be installed in a separate and independent conduit or cable systems from other electrical circuits. Initiating, notification, annunciation, and all other fire alarm system circuits shall be color coded cables and identified by number at termination and splice points.
- F. All Electrical boxes and pull boxes for the fire alarm system shall be identified by having their covers painted red.
- G. Under no circumstances shall fire alarm wire be ty-wrapped to existing conduit or pipes.
- H. Fire Alarm system components, shop drawings shall show indicating and initiating device type and location and shall indicate any device controlled in such cases.
- I. Shop drawings shall also provide device number, area or room number indicating device lable,

type and engineering data.

- J. Conduit and sleeves penetrating fire rated barriers shall be sealed and/or filled with approved material to maintain the fire rating.
- K. Provide nameplates identifying all equipment, junction boxes and controls.

2.22 HEALTHCARE

- A. Provide test certification and documentation as required by NFPA 99. Test shall include, but not be limited to, current leakage, equipotential voltage, and impedance measurements.
- B. The equipment grounding terminal buses of the normal and essential branch-circuit panelboards serving the same individual patient vicinity shall be bonded together with an insulated continuous copper conductor not smaller than #10AWG and installed in a ¾" conduit. Where more than two panelboards serve the same location, this conductor shall be continuous from panelboard to panelboard but shall be permitted to be broken in order to terminate on the ground bus in each panelboard. This ground wire may or may not be shown on the drawings.

2.23 EMERGENCY LIGHTING SYSTEM

- A. Unit Voltage: 120 volts, AC.
- B. Exit Signs:
 - a. Universal LED type Self powered, complete with ceiling, side wall brackets and arrows and faces as indicated.
 - b. Die-cast aluminum construction black or white Face as indicated on the drawings and Red letters.
 - c. LED's protected by clear diffuser and optical diffuser for Smooth look and no visible LED's.
 - d. Manufacturer and series as indicated on the drawings
- C. Emergency battery lighting units:
 - a. LED lamp.
 - b. UV-stable plastic housing.
 - c. Maintenance free batteries for 90 minute operation.
 - d. Self-testing electronics.
 - e. Low-voltage battery disconnect, test switch, AC on light.
 - f. Manufacturer and series as indicated on the drawings.
- D. All components of these systems shall be listed by Underwriters' Laboratories, Inc., and shall be so labeled.
- E. All components used shall be of the same manufacturer and shall be fully guaranteed for a period of three (3) years and the batteries shall be warranted for an additional five (5) years minimum, on a pro-rated basis with a life expectancy of ten (10) years.
- F. All AC wiring to exit signs shall be in separate conduit, and wired to one 20A, 1P, 120 volt breaker. Provide handle lock on breaker.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. Prior to beginning demolition, coordinate with the owner which items shall be removed and retained by the owner, and which items shall be removed and discarded.
- B. Equipment or materials which are to be reused or turned over to the owner shall be carefully removed, cleaned, and stored in a clean, dry area. Should the contractor encounter such equipment which is not in satisfactory condition for reuse and not in working order, the contractor shall notify the owner before performing any further work.
- C. Disconnect electrical services to all equipment requiring removal. Conduit shall be removed back to the point where it will be concealed, at the completion of this contract, unless it is to be reused for connection of new equipment. Conductors and/or cable shall be removed back to the first outlet box, cabinet, or termination point which is to remain.
- D. Equipment, circuits, and utilities that remain, but that are served by feeders or circuits being removed or altered, shall be reconnected in accordance with the methods required by this specification and the NEC, without additional time or cost to the owner.
- E. Provide flat blanking plates, painted to match surrounding finishes, to cover holes or openings left by electrical equipment in existing walls and ceilings, unless these openings are shown to be refilled and finished on the architectural drawings under a different section of the specifications.
- F. Electrical is responsible for removing all electrical work associated with items shown on other drawings, architectural, mechanical, plumbing, fire protection, etc., whether shown on the electrical drawings or not.
- G. Electrical demolition work shown is based on casual field observations and existing drawings and is shown to convey the general scope of work to be existing drawings and is shown to convey the general scope of work to be accomplished.
- H. Electrical shall visit the site and observe existing conditions prior to bidding. No change orders will be considered for items that were visible prior to beginning demolition work.
- I. Temporary power will be provided wherever necessary at no extra cost to the owner in order to keep the building in operation during each phase of renovation.
- J. All electrical power outages shall be coordinated with owner at least 24 hours in advance. Outages which are anticipated to last longer than 1 hour shall be coordinated with owner at least 1 week in advance.
- K. Unless otherwise noted, all electrical devices, etc., in walls and ceilings being demolished shall be removed. Existing electrical devices, etc., shown to remain and located downstream from those being removed, shall be reworked in accordance with the methods required by this specification and the NEC, without additional time or cost to the owner.
- L. All existing electrical work to remain, but interferes with the renovation, shall be reworked in accordance with the methods required by this specification and the NEC, without additional time or cost to the owner.

3.2 COORDINATION OF WORK

- A. Installation of electrical conduits, boxes, and equipment shall not interfere with access to HVAC and plumbing equipment, its controls, or its maintenance.
- B. Relocation of equipment, system connections, or rough-in locations up to ten feet, if necessary, shall be done without additional cost to the owner, or his agents, if done before roughing-in.
- C. The contractor shall coordinate the work under his contract to avoid conflicts between his work and the work of other trades. He shall carefully examine the drawings and shall be responsible for the proper fittings of materials and equipment into the space provided, prior to installing any conduit or equipment. If any departures from the contract documents are deemed necessary by the contractor, detail drawings of such departures and the reasons therefore shall be submitted as soon as practicable to the architect/engineer for his review. No such departures shall be made without this review and written clarification or change order.
- D. The contractor shall cooperate with other contractors and subcontractors to allow for the installation of their work as well as his own.
- E. The contractor shall be responsible for his work fitting in place without conflict with the other trades, where proper planning could avoid interference. Any work installed by this contractor without regard for the work of others, or if a conflict results, must be changed as directed by the architect/engineer without additional cost to the owner.
- F. Coordinate with HVAC, plumbing, and fire protection contractors to ensure that no pipe or duct is run above any panelboard or switchboard.
- G. The contractor shall verify that the electrical equipment to be installed fits in the assigned space prior to running any conduit or installing the equipment. Any potential conflict shall be brought to the attention of the architect/engineer at once.
- H. The architect/engineer reserves the right of observing all concealed work, before being covered. This contractor shall notify the architect/engineer of the need of a job observation at least two working days prior to concealment of work.
- I. Do not install outlets back-to-back, regardless of what may appear to be shown on the drawings. Outlets installed on opposite sides of same wall shall be installed not less than 12" apart as viewed on plan.

3.3 WORKMANSHIP AND INSTALLATION

- A. All work shall be in accordance with the National Electrical Code requirements as amended to date, with the local electric utility company's rules, the Fire Underwriters' requirements and all local, State and Federal laws and regulations. All equipment shall be Underwriters' listed.
- B. In general, all wiring shall be concealed. Wiring to all wall outlets and devices shall be concealed within the walls. Wiring to ceiling outlets shall generally be concealed between the ceiling and the floor or roof above. Where construction requires exposed wiring, conduits or surface raceway shall be neatly arranged parallel and perpendicular to beams and joists with right angle turns consisting of bends, fittings, or outlet boxes where indicated. Drops to switches and convenience outlets shall be concealed in the walls.
- C. Conduits shall be of sizes required by the National Electrical Code increased as required to include bonding conductor as specified. No wire shall be installed until work which might

cause damage to wires or conduits has been completed. Conduits shall be thoroughly cleaned of water or other foreign matter before wire is installed.

- D. Conduits shall be fastened by suitable galvanized clips or approved hangers. Clips and boxes shall be fastened by wood screws on wooden surfaces, machine screws on metal, toggle bolts in masonry block, or by expansion shields in concrete. Parallel runs of conduit shall be neatly clustered with all bends and offsets of uniform pattern.
- E. Separate circuits shall be run for lighting and receptacle outlets as indicated. Circuits shall be balanced and loads and capacities shall be in accordance with requirements of local electric light company and National Boards of Fire Underwriters.
- F. Circuits for emergency lighting shall be run in separate conduits independent from other circuit wiring as required by Code.
- G. The entire electrical system shall be permanently and effectively grounded in accordance with Code requirements.
- H. Switch and receptacle plates shall be installed vertically and plumb. Locate switches close to door frame on latch side of door, or beyond swing of door where appropriate. Where door frames have side lights, switch shall be either located below side light where a 3'-0" mounting height is possible, or beyond the side light. Coordinate with door frame schedule.
- I. The location of conduits, outlets, equipment, etc., as shown shall be considered as approximate only. The Contractor shall study all Plans with relation to spaces surrounding each outlet, in order that his work may fit the work of others. Switches indicated in the same mounting heights shall be ganged together under a common plate.
- J. All splices shall be mechanically and electrically perfect, using approved solderless wire connectors. Splices shall be insulated equivalent to insulation on conductors.
- K. All motors connected under this Section of the Specifications shall be connected for correct rotation.
- L. All fixtures and equipment shall be in first-class condition at time of delivery of building to Owners with all scratches, mars, etc., refinished to factory standards.
- M. All empty conduits shall have nylon pull rope or min. #10AWG wire installed and labeled.
- N. Fixtures mounted within, on or from suspended ceilings shall be supported from structural framing above ceiling framing suspension system. Provide 10 gage safety hanger wire supports for all fixtures recessed in ceiling grids of suspended acoustical ceilings. Hangers shall be independent of ceiling framing suspension system and shall extend from fixture housing to structure above (top cord of bar joist for bar joist construction). Lighting fixtures weighing less than 56 pounds shall have minimum of two hangers, at diagonal corners of fixture (2 locations).
- O. Lighting fixtures weighing more than 56 pounds shall have four hangers, one at each corner of fixture (4 locations). Wires shall have no tension (slack) to prevent ceiling distortion. In addition, attach to ceiling framing "T"s as required by code.

3.4 SUPERVISION

- A. The contractor shall have in charge of the work, at all times during construction, a thoroughly competent foreman with extensive experience in the work to be performed under this contract. Anyone deemed not capable by the architect/engineer shall be replaced immediately upon

request, and after a satisfactory foreman has been assigned, he shall not be withdrawn without the written consent of the engineer.

3.5 CUTTING AND PATCHING

- A. This contractor shall do all cutting and patching necessary for the proper installation of his work and shall repair any damage done by himself or his workman.

3.6 WASTE MATERIALS

- A. The contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his employees or work. At the completion of the work, he shall remove all leftover materials, equipment, and debris resulting from the work done under this division.

3.7 ACCESS TO EQUIPMENT

- A. All equipment shall be installed in a location and manner that will allow for convenient access for maintenance and inspection.
- B. Access doors and panels in walls and ceilings shall be provided as required for concealed equipment, controls, and boxes, and all other items under this division requiring accessibility for operation and maintenance. Doors and panels shall be provided, conforming to the metals division, under this division.

3.8 TESTS

- A. A full scale test with all lights, equipment, and appliances in operation shall be conducted by the contractor at his expense, and the electrical system shall be proven satisfactory for operation and free from defects. Particular attention shall be paid to the balancing of the single-phase loads on the Three-phase system. Any and all defects shall be promptly remedied.
- B. The contractor shall test all wiring and connections for continuity and grounds, before luminaires, equipment, and appliances are connected.

3.9 EQUIPMENT TESTS

- A. All control devices, breakers, switches, contactor motor starters, contactors and relays shall be adjusted so as to operate smoothly without chatter and excessive hum.
- B. The contractor shall ensure that the phasing sequence is the same throughout the entire electrical system.

3.10 IDENTIFICATION

- A. Furnish and install laminated phenolic nameplates engraved to the white core identifying all new panelboards plus circuits on all spaces of switchboards and distribution panels, also all safety switches, controls, relays, junction boxes, pull boxes, pilot lights, special switches and outlets, etc., as furnished under this Section. Nameplates shall identify function of device, space controlled, voltage conditions, fuse size, panel serving switch, etc., as indicated or required without abbreviations. Details shall be as approved.
- B. Provide tags on each end of all pull wires, all intercommunication wires, etc., giving location of other end.

- C. Branch circuit conductors, conductors throughout the building including feeder conductors, conductors in conduits and conductors in wireways and trenches shall have color to identify voltage and service supplied in accordance with the following:
 - a. All metallic bonding conductors - Green.
 - b. All neutral conductors (all systems) - White.
 - c. Phase conductors of 120/208 volt system - black, red, blue.
- D. All circuit conductors of the same color shall be connected to the same ungrounded feeder conductor throughout the installation. Conductors of different voltage systems shall not enter same raceway systems.
- E. Where conductors are not available in the colors indicated, due to size or other reason, the Contractor shall install identifying adhesive bands 3/4" wide of colors indicated above around each conductor within six inches (6") and twelve inches (12") of each end and at a maximum of five foot (5') intervals along wireways, at back of panelboards, etc., where conductors are accessible.
- F. Fire Alarm Identification: Provide address and identification labeling installed on the bases of all addressable initiation and annunciation devices noting circuit and node identification.

3.11 TESTING AND ADJUSTING

- A. The entire installation shall be free from short circuits and improper grounds. Tests shall be made in the presence of the Architects or their representatives. Each panel shall be tested with mains disconnected from the feeder, branches connected and switches closed, all fixtures in place and permanently connected, lamps removed or omitted from the sockets, and all wall switches closed.
- B. Feeders shall be tested with the feeders disconnected from the branch circuit panels. Each individual power circuit shall be tested at the panel, and in testing for insulation resistance to ground, the power equipment shall be connected from proper operation. In no case shall the insulation resistance be less than that required by the National Electrical Code. Failure shall be corrected in a manner satisfactory to the Architect and Engineers.
- C. Each system shall be completely tested and shall be adjusted for proper operation as required by the Architects.
- D. Fire Alarm Certification and Testing: Tests shall be performed by the Contractor and the Manufacturers representative. The completed system shall be tested for proper operation, code compliance, and compliance to this standard. The Contractor and the Manufacturer's Representative shall sign a letter attesting to the completion of testing and its compliance to items outlined above. Testing shall be performed at a time convenient to the Owner. Provide a minimum of 4 hours orientation and operational training when not specified further in Contract Documents. Training shall include operation, troubleshooting, maintenance, and a general system walk-through related to the complete system installation.

3.12 CONTINUITY OF SERVICE AND SCHEDULE OF WORK

- A. All work shall be scheduled and coordinated with the Division 01 specifications. Demolition and removal of electrical items are included as part of this Specification Section 260100, Electric. Patching of existing structure left by removals, specified under Section 02060.

- B. The Contractor shall arrange to execute the work at such times and in such locations as may be required to provide uninterrupted services for the building or any of its sections. If necessary, temporary work shall be installed to provide for this condition. Authorization for interrupting service shall be obtained in writing, from the Owner. Costs for overtime work and temporary work shall be included in the bid.

END OF SECTION

SECTION 275223 - NURSE CALL/CODE BLUE SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Visual/tone nurse-call system.

B. All products provided under this submittal must meet the requirements of anti-ligature equipment appropriate for a behavioral healthcare setting.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Visual/tone nurse-call system.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment cabinets and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Cabling Diagrams: Single-line block diagrams showing cabling interconnection of all components for this specific equipment. Include cable type for each interconnection.
3. Station Installation Details: For built-in equipment, dimensioned and to scale.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Field quality-control reports.

C. Warranty: Sample of special warranty.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For nurse-call equipment to include in emergency, operation, and maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps: All colors for corridor dome lights and zone lights equal to 20 percent of amount installed.
2. Fuses: One for every 10 of each type and rating, but no fewer than 2 of each.
3. Printed Circuit Boards: Each kind, equal to 10 percent of amount installed, but no fewer than one unit.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Compatibility: System shall be capable of integration with any brand of phone system (wired or wireless), staff locating system, CCTV, and fire-alarm system.
- C. Electrical Components, Devices, and Accessories: Listed and labeled according to UL 1069 as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace batteries that fail in materials or workmanship within specified warranty period. Special warranty for batteries applies to materials only, on a prorated basis for specified period.
 1. Warranty Period: Include the following warranty periods, from date of Substantial Completion:
 - a. Nickel-Cadmium Batteries, Lithium Batteries, and Wet-Cell Batteries:
 - 1) Full Warranty: Five years.

1.8 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning with Substantial Completion, provide software support for two years.
- B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of software.
 1. Provide 30 days' notice to Owner to allow scheduling and access to system and to allow Owner to upgrade computer equipment if necessary.

PART 2 - PRODUCTS

2.1 NURSE-CALL SYSTEM GENERAL REQUIREMENTS

- A. Station Zones: Able to program minimum 256 station zones for each master station in the network with minimum eight priority levels and addressable visual and audible annunciation of audible devices such as smoke detectors and door contacts.
- B. System shall provide integrated and centralized "Code Blue" and "Staff Emergency" calls.
- C. Expansion Capability: Equipment ratings, housing volume, spare keys, switches, relays, annunciator modules, terminals, and cable conductor quantities adequate to increase the number of stations in the future by 25 percent above those indicated without adding internal or external components or main trunk cable conductors.
- D. Resistance to Electrostatic Discharge: System, components, and cabling, and the selection, arrangement, and connection of materials and circuits, shall be protected against damage or diminished performance when subjected to electrostatic discharges of up to 25,000 V in an environment with a relative humidity of 20 percent or less.
- E. Equipment: Microprocessor, electronic, modular.
- F. Master Nurse-Call Station: Programmed via a PC.
- G. Wall-Mounted Component Connection Method: Components connect to system wiring in back boxes with factory-wired plug connectors.
- H. Telephone Interface: Permit use of wired and wireless telephones to execute nurse-call master station functions.
- I. Third-Party Pager Interface: Programmable to send tone, numeric, and alphanumeric message to pocket pagers or personal digital assistants and to use industry standard-protocol, RS-485 interface.

2.2 VISUAL/TONE NURSE-CALL SYSTEM

- A. Tektone, or approved equal.
- B. Operational Requirements:
 - 1. Pull-Cord-Call Station Call: Flashes a call-placed lamp on the station and corridor dome light and at the central annunciator. At the same time, it sounds a programmed tone at intervals, at the central annunciator and master. A legend at the master station identifies the calling station, priority as programmed, and location identification.
 - 2. System Reset: Operating reset button at the originating station cancels signals associated with the call.
 - 3. Cord-Set Removal: Initiates a patient station call when the cord set is removed from the jack in the patient station faceplate. Displays location and "cord removed" message on master station. Inserting a cord-set plug or a dummy plug into the jack and operating the station reset button resets the call.

4. Emergency Bath Station Call: Illuminates the digital display on the emergency bath station; rapidly flashes white dome lamp; displays location, priority, and bath on master station; and sounds programmed tone on master station display.

C. Central Annunciator:

1. Lamp type.
2. Lamp Legends: Machine lettered and legible from a distance of at least 48 inches (1200 mm) when a call is present. Legend shall identify initiating station and priority of call.
3. Power-on Indicator: Digital, or push-to-test switch.
4. Audible Signal: Electronic tone.

D. Central Equipment Cabinet:

1. Lockable metal.
2. Houses power supplies, controls, terminal strips, and other components.
3. Power-on indicator lamp.

2.3 SYSTEM COMPONENTS

A. Emergency-Bath Station:

1. Consists of a sliding, chemical-resistant, ABS red fascia marked with the word "URGENT" in bold letters.
2. Capable of being activated with nylon pull cord or by sliding the face of the unit downwards.
3. Activation of the station shall illuminate a reassurance digital display on the face of the unit in addition to notifying the master station.
4. Water resistant and able to withstand routine cleaning and chemical disinfectants.
5. Uses magnetic reed switch technology for reliability and corrosion resistance.
6. Mounts on a single-gang electrical box wire to the respective patient station or input controller.

B. Pull-Cord-Call Station:

1. Pull-Down Switch: Lever-locking type, labeled "Pull Down to Call Help."
2. Reset trigger.
3. Call-placed lamp.
4. Water-resistant construction.

C. Indicator Lamps: Digital type with rated life of 20 years unless otherwise indicated.

D. Station Faceplates, High-Impact Plastic:

1. Color: Match Existing device faceplates
2. Molded or machine-engraved labeling identifies indicator lamps and controls.

E. Corridor Dome Lights and Zone Lights:

1. One-lamp signal lights.

2. Lamps: LED. Front replaceable without tools, low voltage with rated life of 7500 hours. Barriers are such that only one color is displayed at a time.
3. Lenses: Heat-resistant, shatterproof, translucent polymer that will not deform, discolor, or craze when exposed to hospital cleaning agents.

F. Cable:

1. Conductors: Jacketed single and multiple, twisted-pair copper cables.
2. Sizes and Types: As recommended by equipment manufacturer.
3. Cable for Use in Plenums: Listed and labeled for plenum installation.

G. Grounding Components: Comply with requirements in Section 260100 "Short Form Electrical Specification".

2.4 CONDUCTORS AND CABLES

A. Audio Cables:

1. Conductors: Jacketed, twisted-pair and twisted-multipair, untinned solid copper. Sizes as recommended by system manufacturer, but no smaller than No. 22 AWG.
2. Insulation: Thermoplastic, not less than 1/32 inch (0.8 mm) thick.
3. Shielding: For speaker/microphone leads and elsewhere where recommended by manufacturer; No. 34 AWG, tinned, soft-copper strands formed into a braid or equivalent foil.
4. Minimum Shielding Coverage on Conductors: 60 percent.
5. Plenum Cable: Listed and labeled for plenum installation.

B. Data Cable and Hardware: Category 6 balanced twisted-pair cabling and hardware. Comply with requirements in Section 271513 "Communications Copper Horizontal Cabling."

C. Power Conductors and Cables: Copper, solid, No. 20 AWG. Comply with requirements in Section 260100 "Short Form Electrical Specification".

D. Grounding Conductors and Cables: Copper, stranded, No. 16 AWG. Comply with requirements in Section 260100 "Short Form Electrical Specification".

PART 3 - EXECUTION

3.1 INSTALLATION

A. Wiring Method:

1. Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used.
 - a. Install plenum cable in environmental air spaces, including plenum ceilings.
 - b. Conceal raceway and cables except in unfinished spaces.

2. Cable Trays: Comply with requirements in Section 270536 "Cable Trays for Communications Systems."
3. Conduit and Boxes: Comply with requirements in Section 270528 "Pathways for Communications Systems." Flexible metal conduit shall not be used.
 - a. Outlet boxes shall be no smaller than 2 inches (50 mm) wide, 3 inches (75 mm) high, and 2-1/2 inches (64 mm) deep.
- B. Install cables without damaging conductors, shield, or jacket.
- C. Do not bend cables, while handling or installing, to radii smaller than as recommended by manufacturer.
- D. Pull cables without exceeding cable manufacturer's recommended pulling tensions.
 1. Pull cables simultaneously if more than one is being installed in same raceway.
 2. Use pulling compound or lubricant if necessary. Use compounds that will not damage conductor or insulation.
 3. Use pulling means, including fish tape, cable, rope, and basket-weave wire or cable grips, that will not damage media or raceway.
- E. Install exposed raceways and cables parallel and perpendicular to surfaces or exposed structural members, and follow surface contours. Secure and support cables by straps, staples, or similar fittings designed and installed so as not to damage cables. Secure cable at intervals not exceeding 30 inches (760 mm) and not more than 6 inches (150 mm) from cabinets, boxes, or fittings.
- F. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- G. Separation of Wires: Separate speaker/microphone, line-level, speaker-level, and power-wiring runs. Run in separate raceways or, if exposed or in same enclosure, provide 12-inch (300-mm) minimum separation between conductors to speaker/microphones and adjacent parallel power and telephone wiring. Provide separation as recommended by equipment manufacturer for other conductors.
- H. Splices, Taps, and Terminations: Make splices, taps, and terminations on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Install terminal cabinets where there are splices, taps, or terminations for eight or more conductors.
- I. Impedance and Level Matching: Carefully match input and output impedances and signal levels at signal interfaces. Provide matching networks if required.
- J. Identification of Conductors and Cables: Comply with requirements in Section 270553 "Identification for Communications Systems" for cable administration, cable schedule, and cable and wire identification.
- K. Equipment Identification:

1. Comply with requirements in Section 270553 "Identification for Communications Systems" for equipment labels and signs and labeling installation requirements.
2. Label stations, controls, and indications using approved consistent nomenclature.

3.2 EXISTING SYSTEMS

- A. There shall be no connection with existing systems. All existing systems in the area of work are to be demolished and removed.

3.3 GROUNDING

- A. Ground cable shields and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other signal impairments.
- B. Signal Ground Terminal: Locate at main equipment cabinet. Isolate from power system and equipment grounding except at connection to main building ground bus.
- C. Grounding Provisions: Comply with requirements in Section 270526 "Grounding and Bonding for Communications Systems."

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform tests and inspections.
 1. Manufacturer's Field Service Assistance: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- C. Tests and Inspections:
 1. Schedule tests a minimum of seven days in advance.
 2. Report: Submit a written record of test results.
 3. Operational Test: Perform an operational system test and demonstrate proper operations, adjustment, and sensitivity of each station. Perform tests that include originating station-to-station and "All Call" messages and pages at each nurse-call station. Verify proper routing, volume levels, and freedom from noise and distortion. Test each available message path from each station on the system. Meet the following criteria:
 - a. Speaker Output: 90 dB plus or minus 3 dB, 300 to 3000 Hz, reference level threshold of audibility 0 dB at 0.02 mPa of sound pressure.
 - b. Gain from patient's bedside station to nurse station, with distortion less than 65 dB (plus or minus 3 dB, 300 to 3000 Hz).
 - c. Signal-to-Noise Ratio: Hum and noise level at least 45 dB below full output.

4. Test Procedure:

- a. Frequency Response: Determine frequency response of two transmission paths by transmitting and recording audio tones.
 - b. Signal-to-Noise Ratio: Measure the ratio of signal to noise of the complete system at normal gain settings using the following procedure: Disconnect a speaker/microphone and replace it in the circuit with a signal generator using a 1000-Hz signal. Measure the ratio of signal to noise and repeat the test for four speaker microphones.
 - c. Distortion Test: Measure distortion at normal gain settings and rated power. Feed signals at frequencies of 300, 400, 1000, and 3000 Hz into each nurse-call equipment amplifier, and measure the distortion in the amplifier output.
- D. Retesting: Rectify deficiencies indicated by tests and completely retest work affected by such deficiencies at Contractor's expense. Verify, by the system test, that the total system meets these Specifications and complies with applicable standards. Report results in writing.
- E. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified.
- F. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting sound levels and controls to suit actual occupied conditions. Provide up to three visits to Project during other-than-normal operating hours for this purpose.

3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel and caregiver staff to adjust, operate, and maintain nurse-call equipment.

END OF SECTION 275223

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