

**STATE OF NEW HAMPSHIRE
DEPARTMENT OF NATURAL AND CULTURAL RESOURCES**

172 Pembroke Road
Concord, NH 03302-1856
Tel. (603) 271-2606 Fax (603) 271-2629

PROJECT MANUAL

Project No.: CAP2131

White Lake State Park

Area 1 Toilet Building Renovations

Tamworth, New Hampshire

June 17, 2024

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SECTION 00 11 16

INVITATION TO BID

WHITE LAKE AREA 1 TOILET BUILDING RENOVATIONS
CAP 2131
TAMWORTH, NEW HAMPSHIRE

1. **Sealed Bids:** Proposals for a General Contract for the Construction of the above project will be received by the Owner until 2:00 P.M. prevailing time on Tuesday, July 16, 2024, at which time they will be publicly opened and read aloud. All Bids shall be made out only on the form included in the specifications package and delivered in a sealed, labeled envelope marked: Bid Proposal for the White Lake Area 1 Toilet Building Renovations and deposited in the bid box located at the reception desk of the Department of Natural and Cultural Resources (DNCR) offices at 172 Pembroke Road in Concord, NH. Bidders are invited to attend the Bid opening. Bids received after the above stated time and date will not be accepted.
2. **Technical Questions:** Questions regarding the Bidding Documents shall be referred to: Department of Natural and Cultural Resources, 172 Pembroke Road, Concord New Hampshire, 03301, attention Scott Coruth, Architect, Telephone (603) 271-3676, email: scott.d.coruth@dn-cr.nh.gov.
3. **Documents:** Bidding Documents may be examined at the Design, Development and Maintenance Section of DNCR, 172 Pembroke Road, Concord NH and at the following locations:

Construction Summary of New Hampshire Inc.: 734 Chestnut Street, Manchester, New Hampshire 03104, (603) 627-8856, www.constructionsummary.com

Infinite Imaging: 933 Islington Street, Portsmouth, NH 03801, (800) 581-2712 or (603) 436-3030, www.planroom.infiniteimaging.com

McGraw-Hill Construction: www.construction.com

Signature Digital Imaging: 45 Londonderry Turnpike, Hooksett, NH 03106, (603) 624-4025, www.signaturenh.com

Works in Progress: 20 Farrell Street, Suite 103, South Burlington, VT 05403. (800) 286 3633 or (802) 658-3797

New Hampshire Department of Administrative Services Bureau of Purchase and Property Website: <http://admin.state.nh.us/purchasing/vendorresources.asp>

New Hampshire State Parks Website: www.nhstateparks.org/news-events/improving-state-parks/rfps-projects.
4. **Qualifications:** All companies, corporations, and trade names bidding must be registered and have a Certificate of Existence from the New Hampshire Secretary of State's Office, Corporate Division (telephone 603-271-3244) in order to do business with the State of New Hampshire

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5. Bid Security: A Bid Bond in the amount of five (5%) percent of the total amount of the lump sum bid price shall accompany each Bid Proposal in accordance with the Instructions to Bidders.
6. Bonds: Bidders shall be required to provide the Owner with financial responsibility as security for the completion of the contract in accordance with the plans, specifications, and contract documents, in the form of a Performance and Payment Bond in the amount of One Hundred (100%) Percent of the contract award, if the contract award is seventy-five thousand dollars (\$75,000) or more, the cost of which shall be a part of the Base Bid. The form of bond and the surety shall be acceptable to the Commissioner. No contract bond shall be required on contract awards of less than seventy-five thousand dollars (\$75,000).
7. Inspection of Site: A pre-bid tour of the existing building/site will be conducted by the Owner on July 2, 2024, at 10:00 a.m. Contractors shall gather and meet in the main parking lot of Park and the Owner will commence the pre-bid tour from that location. Attendance by Bidders shall be considered mandatory.
8. Awards: In most cases the proposal submitted by the qualified bidder with the lowest base bid price shall be selected. However, the Department of Natural and Cultural Resources (DNCR) reserves the right to reject any or all proposals or advertise for new proposals as it judges to be in the best interest of the state.
9. Regulations: Bidders' attention is called to the fact that this Project is required to comply with, in addition to all other requirements of the Contract Documents, Equal Employment Opportunity Regulations.
10. Build America, Buy America Act: Bidders' attention is called to the fact that this Project is funded in whole or in part by a Federal Financial Assistance Program that is required to comply with the Build America, Buy America Act ("the Act"). Pub. L. No. 117-58, §§ 70901-52. Bidder is required to comply with, in addition to all other requirements of the Contract Documents, the Act.

END OF INVITATION TO BID

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

DEFINITIONS

1. Definitions set forth in the Specification Section 00 72 00 "General Conditions" or in other Contract Documents are applicable to the Bidding Documents.
2. Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements include the Invitation to Bid, Instructions to Bidders, the Proposal Form and other sample Bidding and Contract forms.
3. Addenda are written or graphic instruments issued prior to the execution of the Contract. They modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.
4. A Bid is a complete and properly signed Proposal to do the Work or designated portion thereof for the sums stipulated therein, submitted in accordance with the Bidding Documents.
5. The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or deducted for sums stated in Alternate Bids.
6. An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in Work, as described in the Bidding Documents, is accepted.
7. A Unit Price is an amount stated in the Bid as a possible price per unit of measurement for materials, equipment, services, or a portion of the Work as described in Bidding Documents. The choice of using Unit Prices, or an alternative method of payment, for additional Work shall be left solely to the Owner's discretion.
8. A Bidder is a person or entity who submits a Bid.
9. A Sub-Bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

BIDDER'S REPRESENTATION

1. Each Bidder by making his Bid represents that he has examined and understands the Bidding Documents, that the Bidding Documents are adequate to produce the required results, and that his Bid is in accordance therewith.

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2. Each Bidder by making his Bid represents that he has visited and thoroughly inspected the existing building and site and familiarized himself with the local conditions under which the Work will be performed. Bidders are encouraged to make any and all inspections and tests as they feel necessary to achieve such familiarization prior to submitting Bids. Such inspections and tests shall be conducted at times mutually acceptable to the Owner and Bidder. Unless waived by the Owner, Bidders shall make repairs following their testing, as necessary to restore tested areas to pre-testing condition. Should a Bidder conclude that time or other factor(s) prohibits him from performing sufficient tests, he shall so notify the Owner, in writing, prior to the receipt of Bids.
3. The submission of a Bid will be construed as conclusive evidence that the Bidder has made all such examinations and inspections necessary for a complete and proper assessment of the Work required, and that the Bidder has included in his Bid a sum sufficient to cover the cost of all items necessary to perform the Work as set forth in the proposed Contract Documents. No allowance will be made to a Bidder because of lack of such examination, inspection, or knowledge.
4. Each Bidder by making his Bid represents that he has assessed the conditions of the current construction marketplace, and verified that an adequate, experienced workforce is available to suitably man the Work of this Project and complete it in a timely fashion.
5. Each Bidder is assumed to have made himself familiar with all Federal, State and Local laws, ordinances, and regulations which in any manner affect those engaged in or upon the Work, or in any way affect those engaged or employed in the Work, and no plea of misunderstanding will be considered on account of ignorance thereof. The Contractor shall comply with all taxes, fees and assessments as levied by Federal, State and Local authorities.
6. Each Bidder by making his bid certifies, on behalf of itself and all Sub-contractors, Sub-subcontractors, Suppliers, and other entities retained by the contractor, that they have read, understood, and will comply with the Build America, Buy America Act ("the Act"). Pub. L. No. 117-58, §§ 70901-52, as required by federal law.

BIDDING PROCEDURES

1. All Bids must be prepared on the Bid Proposal Form provided in the Specification and submitted in duplicate copies in accordance with the Notice to Bidders and Instructions to Bidders. **Any bids submitted that are not on the official bid proposal forms will not be accepted.**
2. A Bid shall be invalid if it has not been deposited at the designated location prior to the time and date in the Invitation to Bid, or prior to any extension thereof issued to the Bidders.
3. Each copy of a Bid shall be signed by the person or persons legally authorized to bind the Bidder to a Contract. A Bid by a corporation shall further give the state of incorporation and have a corporate seal affixed.
4. Unless otherwise provided in any supplement to these Instructions to Bidders, no Bidder shall modify, withdraw, or cancel his Bid or any part thereof for Ninety (90) days after the time designated for the receipt of Bids in the Notice to Bidders.

5. Prior to the receipt of Bids, Addenda will be e-mailed, mailed, or delivered to each person or firm recorded by the Owner as having received the Bidding Documents and will be available for inspection wherever the Bidding Documents are kept available for that purpose.

BID SECURITY

1. Bid Security shall be made payable to the Owner, in the amount of not less than five percent (5%) of the Bid Sum and shall be attached to the Bid. Security shall be either a certified check made payable to the "Treasurer, State of New Hampshire," or Bid Bond issued by surety licensed to conduct business in the State of New Hampshire. The successful Bidder's security will be retained until he has signed the Agreement or Contract and furnished the required Performance and Payment Bonds and Certificates of Insurance. The Owner reserves the right to retain the Security of the next two lowest Bidders until the low Bidder enters into a Contract, or until Sixty (60) days after Bid opening, whichever occurs first. Bid Security of all other Bidders will be returned as soon as practicable. If any Bidder refuses to enter into an Agreement or Contract, the Owner will retain his Bid Security as liquidated damages, but not as a penalty.

EXAMINATION OF BIDDING DOCUMENTS

1. Each Bidder shall examine the Bidding Documents carefully and, not later than seven (7) days prior to the date of receipt of Bids, shall make written request to the Owner for interpretation or correction of any ambiguity, inconsistency, or error therein, which he may discover. Any interpretation or correction will be issued as an Addendum by the Owner. Only a written interpretation or correction by Addendum will be binding. No Bidder shall rely upon any interpretation or correction given by any other method. Bidders are encouraged to direct any questions which may arise to the Owner, in order to provide necessary clarifications prior to the receipt of Bids. Bidders shall promptly notify the Owner of any ambiguity, inconsistency, or error which they may discover upon examination of the Bidding Documents, or the existing building, site, or local conditions. Should a Bidder fail to notify the Owner of errors, discrepancies, or contradictions, he shall be assumed to have bid the more expensive alternative.

SUBSTITUTIONS

1. Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents. Where the language "or approved equal" is used in the Bidding Documents, it is intended to require that all such materials and equipment shall be submitted as required by these Instructions to Bidders and approved by the Owner prior to the receipt of Bids.
2. No substitution will be considered unless written request has been submitted to the Owner for approval at least seven (7) days prior to the date for receipt of Bids. Each such request shall conform to the requirements of Section 01 25 00 "Substitution Procedure."
3. If a Bidder proposes to use a material which, while suitable for the intended use, deviates in any way from the detailed requirements of the Contract Documents, he shall inform the Owner in writing of the nature of such deviations at the time the material is submitted for approval. It shall

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be the responsibility of the Bidder to notify the Owner, in writing, of the presence of Asbestos or any other hazardous materials in any proposed substitution. Such written notice shall be in the form of a cover letter attached to the related documents.

4. In requesting approval of deviations or substitutions, a Bidder shall provide, upon request, evidence leading to a reasonable certainty that the proposed substitution or deviation will provide a quality of result at least equal to that otherwise attainable. If, in the opinion of the Owner, the evidence presented by the Bidder does not provide a sufficient basis for such reasonable certainty, the Owner may reject such substitution or deviation without further investigation.
5. In requesting approval of substitutions, a Bidder represents that he will provide the same warranty and/or guarantee for the substitution that he would for that specified.
6. The Contract Documents are intended to produce a building and site improvements of consistent character and quality of design. The Owner shall judge the design and appearance of proposed substitutes on the basis of their suitability in relationship to the overall design of the Project, as well as for their intrinsic merits. The Owner will not approve proposed substitutions which, in his opinion, would be out of character, obtrusive, or otherwise inconsistent with the character or quality of design of the project.
7. The Contractor shall be solely responsible for coordinating the installation of accepted substitutions, making such changes as may be required for the Work to be complete in all respects. Any additional cost, or any loss or damage arising from the substitution of any material or any method for those originally specified shall be borne by the Contractor, notwithstanding approval or acceptance of such substitution by the Owner, unless such substitution was made at the written request or direction of the Owner.
8. The burden of proof of the merit of a proposed substitution is upon the proposer. Approval of a proposed substitution is valid only upon issuance by the Owner in written form, and the Owner's decision of approval or disapproval of a proposed substitution shall be considered final.

DETERMINATION OF RIGHT TO DO BUSINESS WITH STATE OF NEW HAMPSHIRE

1. If selected as the low bidder, the bidder must be registered and have a Certificate of Good Standing from the Secretary of State, Corporate Division (telephone 603-271-3244) in order to do business with the State of New Hampshire.

PROPOSAL SELECTION

1. In most cases the proposal submitted by the qualified bidder with the lowest base bid price shall be selected. However, the Department of Natural and Cultural Resources (DNCR) reserves the right to reject any or all proposals or advertise for new proposals as it judges to be in the best interest of the State of New Hampshire.

CONTRACTORS QUALIFICATIONS

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1. Upon the Owner's request, the successful bidder shall provide evidence that they have been successfully performing this type, scale, and quality of Work for a minimum of five (5) years. Upon request by the Owner, a comprehensive list of all similar projects worked on in the past two (2) years by the Contractor shall be submitted along with contact information for three (3) references or owners representatives involved with three (3) different projects completed by the Contractor.

EXECUTION OF AGREEMENT

1. Execution and Approval of Agreement: The Agreement shall be signed by the successful Bidder and returned, together with Bonds if applicable, within fifteen (15) Days after the Agreement has been mailed or otherwise delivered to the Bidder. No Agreement shall be considered as in effect until it has been fully executed by all Parties thereto and, when the Price Limitation is more than \$10,000, the Agreement has been concurred in by Governor and Council.
2. Failure to Execute Agreement: Failure to execute the Agreement within fifteen (15) Days after the Agreement has been mailed or otherwise delivered to the successful Bidder shall be just cause for the cancellation of the bid and the forfeiture of the Bid Security which shall become the property of the Department, not as a penalty, but in liquidation of damages sustained. Award of the Contract may then be made to the next lowest Bidder, or the Work may be re-advertised as the Commissioner of the Department of Natural and Cultural Resources may decide.

PRECONSTRUCTION CONFERENCE

1. Either before or soon after the actual award of the Contract (but in any event prior to the start of construction), the Contractor or his representative and his principal subcontractors shall attend a preconstruction conference with representatives of the Owner. The conference will serve to acquaint the participants with the general plan of contract administration and requirements under which the construction operation is to proceed.

END OF INSTRUCTIONS TO BIDDERS

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SECTION 00 41 00

BID PROPOSAL FORM

Project No. **CAP 2131**

PROJECT: **White Lake Area 1 Toilet Building Renovations**
Tamworth, New Hampshire

BID OPENING DATE: **July 16, 2024**, at 2:00 pm at DNCR's office at 172 Pembroke Road, Concord, NH

START DATE: **October 21, 2024**

COMPLETION DATE: **May 23, 2025**

Sealed bid proposals for the above project will be accepted until the time and date indicated above. Bids may be deposited in the bid box at DNCR's offices in Concord or mailed to the attention of Scott Coruth, Architect, Department of Natural and Cultural Resources (DNCR), 172 Pembroke Road, Concord NH 03301. Please note on the outside of the sealed envelope: Bid Proposal for the White Lake Area 1 Toilet Building Renovations.

DATE: _____

PROPOSAL OF: _____

GRAND TOTAL / LUMP SUM BASE BID (A+B): _____

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White Lake Area 1 Toilet Building Renovations

PROPOSAL

Proposal of...

(name)

(address)

To furnish and deliver all materials, except as noted, and to perform all work in accordance with the Contract of the State of New Hampshire, Department of Natural and Cultural Resources for the construction of...

Project: **CAP 2131** **White Lake Area 1 Toilet Building Renovations**
Tamworth, New Hampshire

Commissioner
Department of Natural and Cultural Resources
172 Pembroke Road
Concord, N.H. 03302-1856

Commissioner:

In accordance with the advertisement of the Department of Natural and Cultural Resources inviting proposals for the project herein before named and in conformity with the Plans and Specifications on file in the office of the Department of Natural and Cultural Resources, _____
(firm name) hereby certifies that _____ is/are the only person, or persons, interested in this proposal as principals; that this proposal is made without collusion with any person, firm, or corporation; that an examination has been made of the Plans, of the Standard Specifications, and Special Attentions, Supplemental Specifications, and Special Provisions, all of which are attached hereto, and also of the site of the work; and I, or we, propose to furnish all necessary machinery, equipment, tools, labor, and other means of construction, and to furnish all materials specified in the manner and at the time prescribed; and understand that the quantities of work as shown herein are approximate only and are subject to increase or decrease, and further understand that all quantities of work are to be performed at the quoted prices.

To execute the form of contract and begin work within 15 (fifteen) days after the notice to proceed has been received or otherwise delivered to the contractor and to prosecute said work until its completion.

It is further proposed:

To furnish a contract bond in the amount of one hundred percent (100%) of the contract award, if the contract award is seventy-five thousand dollars (\$75,000) or more, as security for the completion of the contract in accordance with the plans and specifications and contract documents. The form of bond and the surety shall be acceptable to the Commissioner. No contract bond shall be required on contract awards of less than seventy-five thousand dollars (\$75,000).

To guarantee all of the work performed under this contract to be done in accordance with the plans and specifications and contract documents.

Enclosed, herewith, find certified check or bid bond in the amount of 5% of the total amount of the Lump Sum Price made payable to the "Treasurer, State of New Hampshire" as a proposal guarantee which is understood, will be forfeited in the event the form of contract is not executed, if awarded to the undersigned. Note: Personal checks will not be accepted as a proposal guarantee.

The undersigned acknowledges receipt of the following addenda, issued during the bidding time, and states that these have been incorporated in the proposal:

Addendum #1 dated _____

Addendum #2 dated _____

Addendum #3 dated _____

Dated _____

ALLOWANCE #1: Unanticipated Modification and/or Additions to Contract Items:

Include in the Contract, a stipulated sum/price of \$55,000 for use upon the Project Managers instruction. This Allowance will make money available for modifications and/or additions to contract items due to owner-initiated changes, or for unknown, latent, or differing existing conditions, or for the removal of hazardous materials that are encountered by construction.

- a. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Allowance. The cost of the bond for the amount of Allowance shall be included as part of the lump sum base bid.
- b. Funds will be drawn from an Allowance only by Change Order. Contractor can proceed with Change Order Work against Allowance with direction from the Project Manager. The Contractor shall not proceed with any work that will exceed the amount of Allowance remaining.
- c. Credits can only be added to an Allowance by Change Order. The Contractor may not use a credit until a Change Order is fully executed.
- d. Notwithstanding the Contractors objection, the Project Manager may at any time reduce the funds remaining in the Allowance by Change Order.
- e. At Final Payment of the Contract, funds remaining in the Allowance will be credited to the State.

SCHEDULE OF VALUES: White Lake Area 1 Toilet Building Renovations

INDICATE DOLLAR AMOUNT OF CONTRACT SUM ALLOCATED TO EACH CATEGORY OF WORK AS DESIGNATED BELOW:

Specification Sections	Description	Amount
	General Conditions & Requirements	
	Bond Costs	
	Insurance	
02 41 16 02 41 19	Demolition	
03 30 00	Cast-In-Place Concrete	
06 10 00	Rough Carpentry	
06 13 00	Heavy Timber Construction	
06 20 00	Finish Carpentry	
06 61 16	Solid Surfacing Fabrications	
06 64 00	Plastic Paneling	
07 25 00	Weather Barriers	
07 31 13	Asphalt Shingles	
07 46 23	Wood Siding	
07 92 00	Joint Sealants	
08 16 00	Composite Doors	
08 62 00	Unit Skylights	
08 71 00	Door Hardware	
09 29 00	Gypsum Board	
09 67 23	Resinous Flooring	
09 91 00 09 93 00	Painting, Staining and Transparent Finishing	
10 14 00	Signage	
10 21 00	Compartments and Cubicles	
10 28 00	Toilet, Bath, and Laundry Accessories	
22 00 00	Plumbing	
22 13 13	Facility Sanitary Sewers	
23 00 00	Heating, Ventilating and Air Conditioning	
26 00 00	Electrical	
31 10 00	Site Clearing	
31 20 00	Earth Moving	

Sub Total (A):**Allowance #1 (B):****\$55,000**

Grand Total: lump sum base bid (A + B)

NOTE: This Schedule of Values must be completely filled out in order for bid proposal to be considered responsive.

SIGNATURE PAGE

Company Name: _____

Address: _____

Phone: _____

E-mail Address: _____

Signature of Authorized Bidder:

Print: _____

Title: _____

Address of Bidder: _____
(If different than company)

Names and Addresses of Members of the Firm/Corporation

Name	address

Name	address

Name	address

SECTION 00 72 00

GENERAL CONDITIONS

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ARTICLE 1 – GENERAL PROVISIONS

1.01 Definitions

- A. Addenda: Written or graphic instruments issued prior to opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
- B. Agreement: The written agreement between the Parties, executed on New Hampshire Form Number P-37, and these General Conditions, as modified, and exhibits and attachments made part of the agreement upon execution.
- C. Allowance: The sum stipulated in the Contract Documents, for use by the Owner to pay for unanticipated Modifications or Changes to the Work.
- D. Architect: The term "Architect", where used throughout the Contract Documents, shall indicate the Design Professional retained or employed by the Owner and having the authority to make decisions about the design intent of the Project.
- E. Bidding Requirements: The Invitation to Bid, Instructions to Bidders, bid bond or other bid security, if any, the Bid Proposal Form, and the bid with any attachments.
- F. Business Day: All Days, except Saturdays, Sundays, and legal holidays indicated in the Contract Documents.
- G. Change Order: A written order signed by the Parties after execution of the Agreement, indicating changes in the scope of Work, the price of the changes to be applied against the Allowance, or requested changes to the Contract Time to be executed by a contract amendment.
- H. Construction Change Directive: A change to the Work directed by the Owner pursuant to Section 6.03.

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- I. Construction Schedule: A schedule, prepared and maintained by the Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Time.
- J. Contract: The entire and integrated written Agreement between the Owner and Contractor concerning the Work.
- K. Contract Documents: Consist of the Agreement, Invitation to Bid, Instructions to Bidders, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract.
- L. Contract Price: The stated amount in the Contractors bid, excluding Allowances, to perform the Work under the Contract Documents, as modified by any Alternates.
- M. Contract Time: The period of time between the Date of Commencement and the total time authorized to achieve Final Completion.
- N. Contractor: The person or entity identified in the Agreement and includes the Contractor's Representative.
- O. Date of Commencement: The date of commencement of the Work as identified in the Notice to Proceed.
- P. Day: A calendar day.
- Q. Defective Work: Any portion of the Work that does not conform to the requirements of the Contract Documents.
- R. Design Professional: The licensed architect or engineer, and its consultants, retained or employed by the Owner to perform design services for the Project.
- S. Final Completion: The date when the Contractor's obligations under this Agreement are complete and accepted by the Owner and final payment becomes due and payable, as enumerated in Box 1.7 "Completion Date" of the Agreement.
- T. Hazardous Material: Any substance or material identified now or in the future as hazardous under the Law, or any other substance or material that may be considered hazardous or otherwise subject to statutory or regulatory requirement governing handling, transportation, disposal, or cleanup.
- U. Law: Federal, state, or local law, ordinance, code, rule, and regulations applicable to the Work with which the Contractor must comply that are enacted as of the Agreement date.
- V. Modification: A written amendment to the Contract signed by both Parties, a Change Order, a Construction Change Directive, or a written order for a minor change in the Work issued by the Design Professional.

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- W. Notice to Proceed: A written notice by the Owner to the Contractor fixing the date on which the Contract Time will commence to run and on which Contractor shall start to perform the Work.
- X. Others: Other contractors, suppliers, and persons or entities at the Site who are not employed by the Contractor or Subcontractors.
- Y. Owner: The State Agency indicated in Box 1.1 "State Agency Name" of the Agreement and includes the Owner's Representative.
- Z. Owner's Representative: The Owners appointed representative having authority to act on the Owners behalf and shall be responsible for general supervision and administration of the Contract.
- AA. Parties: Collectively the Owner and the Contractor.
- BB. Price Limitation: The amount indicated in Box 1.8 "Price Limitation" of the Agreement. The Price Limitation is the grand total lump sum, comprised of the Contract Price and the Allowance, available to pay for the Work under the Construction Documents.
- CC. Project: The building, facility, or other improvements for which the Contractor is to perform Work under the Agreement. It may also include construction by the Owner or Others.
- DD. Site: The area of the Project location where the Work is to be performed.
- EE. Subcontractor: A person or entity retained by the Contractor as an independent contractor to provide labor, materials, equipment, or services necessary to complete a specific portion of the work.
- FF. Substantial Completion: The date when the Work (or a specified part thereof) is sufficiently complete in accordance with the Contract Documents so that the Owner may occupy or utilize the Project, or a designated portion, for the use for which it is intended, without unapproved disruption.
- GG. Sub-Subcontractor: A person or entity who has an agreement with a Subcontractor, another Sub-subcontractor, or Supplier to perform a portion of the Subcontractor's Work or to supply material or equipment.
- HH. Supplier: A person or entity retained by the Contractor to provide material or equipment for the Work.
- II. Work: The construction and services necessary or incidental to fulfill the Contractor's obligations for the Project in conformance with and reasonably inferable from the Agreement and the Contract Documents. The Work may refer to the whole Project or only a part of the Project if work is also being performed by the Owner or Others.

1.02 Parties Relationship

- A. The Parties agree to proceed with the Project on the basis of mutual trust, good faith, and fair dealing. The parties shall each endeavor to promote harmony and cooperation among all Project participants.

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- B. The Contractor represents that it is an independent contractor and that in its performance of the Work it shall act as an independent contractor.
- C. Neither the Contractor nor any of its agents or employees shall act on behalf of or in the name of the Owner.

1.03 Ethics

- A. The Parties shall perform their obligations with integrity, ensuring at a minimum that each:
 - 1. Avoids conflicts of interest and promptly discloses any to the other Party.
 - 2. Warrants that it has not and shall not pay or receive any contingent fees or gratuities to or from the other Party, including its agents, officers, and employees, Subcontractors, or others for whom they may be liable, to secure preferential treatment.

1.04 Design Professional

- A. The Owner, through its Design Professional, shall provide all architectural and engineering design services necessary for completion of the Work, excluding however:
 - 1. Design services delegated to the Contractor in accordance with Section 2.15.
 - 2. Services within the construction means, methods, techniques, sequences, and procedures employed by the Contractor, its Subcontractors, and Sub-subcontractors in connection with their construction operations.

1.05 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

- A. The Owners design professionals, including the Architect, the Architects consultants, Engineers, and other professionals providing services shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and Suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the design professionals reserved rights.
- B. The Contractor, Subcontractors, Sub-subcontractors, and Suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and Suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of Work without the specific written consent of the Owner, and Owner's design professionals.

1.06 Digital Data Use and Transmission

- A. Except as otherwise stated elsewhere in the Agreement, the Parties may transmit and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to shop drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

- B. If the Agreement does not establish protocols for electronic or digital transmittals, the Parties shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 2 – CONTRACTOR'S RESPONSIBILITIES

2.01 General Responsibilities

- A. The Contractor shall use its diligent efforts to perform the Work in an expeditious manner consistent with the Contract Documents. Such Work includes furnishing construction administration and management services.
- B. The Contractor shall provide all labor, materials, equipment, and services necessary to complete the Work, all of which shall be provided in full accord with and reasonably inferable from the Contract Documents.
- C. Unless the Contract Documents instruct otherwise, the Contractor shall solely be responsible for and have control over the construction means, methods, techniques, sequences, procedures, site security, and safety precautions, and for coordinating all portions of the Work under the Agreement.
- D. The Contractor shall perform Work only within locations allowed by the Contract Documents, Law, and applicable permits unless otherwise directed by the Owner.

2.02 Construction Personnel and Supervision

- A. The Contractor shall provide competent supervision for the performance of the Work. Before commencing the Work, or making a change in the supervisory personnel, the Contractor shall notify the Owner in writing of the name and qualifications of its proposed superintendent(s) and project manager so the Owner may review the individual's qualifications. If, for reasonable cause, the Owner refuses to approve the individual, or withdraws its approval after once giving it, the Contractor shall name a different superintendent or project manager for the Owner's review. Any disapproved superintendent shall not perform in that capacity thereafter at the Site. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.
- B. The Contractor shall be responsible to the Owner for acts or omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors and Suppliers.
- C. The Contractor shall permit only qualified persons to perform the Work. The Contractor shall enforce safety procedures, strict discipline, and good order among persons performing the Work. If the Owner determines that a particular person does not follow safety procedures, or is unfit or

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unskilled for the assigned Work, the Contractor shall immediately reassign the person upon receipt of the Owner's written notice to do so.

- D. The Contractor's representative shall possess full authority to receive instructions from the Owner and to act on those instructions.
- E. The Contractor shall coordinate and supervise the work performed by Subcontractors to ensure that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The Contractors and all Subcontractors at all times shall afford each trade, any separate contractor, or the Owner and Others, every reasonable opportunity for the installation of their work and the storage of materials, subject to the specific limitations or restrictions of a particular site.

2.03 Cooperation with Work of Owner and Others

- A. The Owner may perform work at the Site directly or by Others. Any agreements with Others to perform construction or operations related to the Project shall include provisions pertaining to insurance, indemnification, waiver of subrogation, consequential damages, coordination, interference, cleanup, and safety that are substantively the same as the corresponding provisions of the Agreement.
- B. If the Owner elects to perform work at the Site directly or by Others, the Parties shall coordinate the activities of all forces at the Site and agree upon fair and reasonable schedules and operational procedures for Site activities. The Owner shall require each separate contractor to cooperate with the Contractor and assist with the coordination of activities and the review of construction schedules and operations. The Contract Price and Contract Time may be equitably adjusted for changes resulting from the coordination of construction activities, and the Construction Schedule shall be revised accordingly.
- C. With regard to work of the Owner and Others, the Contractor shall:
 - 1. Proceed with the Work in a manner that does not hinder, delay, or interfere with the work of the Owner or Others or cause the work of the Owner or Others to become defective;
 - 2. Afford the Owner or Others reasonable access for introduction and storage of their materials and equipment and performance of their activities; and
 - 3. Coordinate the Contractor's Work with theirs.
- D. Before proceeding with any portion of the Work affected by the construction or operations of the Owner or Others, the Contractor shall give the Owner prompt written notification of any defects the Contractor discovers in their work which will prevent the proper execution of the Work. The Contractor's obligations in this subsection do not create a responsibility for the work of the Owner or Others but are for the purpose of facilitating the Work. If the Contractor does not notify the Owner of defects interfering with the performance of the Work, the Contractor acknowledges that the work of the Owner or Others is not defective and is acceptable for the proper execution of the Work. Following receipt of written notice from the Contractor of defects, the Owner shall promptly inform the Contractor what action, if any, the Contractor shall take with regard to the defects.

2.04 Contract Document Review

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- A. Prior to commencing the Work, the Contractor shall examine and compare all Contract Documents as well as information furnished by the Owner, shall take field measurements of any existing conditions related to the Work, and shall observe any conditions at the Site affecting the Work. These obligations are for the purpose of facilitating coordination and construction of the Work by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Owner and, if directed, the Design Professional in the form of a request for information (RFI) any errors, inconsistencies, or omissions discovered by or made known to the Contractor by such examination. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.
- B. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, ordinances, codes, rules and regulations, or lawful orders of authorities having jurisdiction, but the Contractor shall promptly report to the Owner any nonconformity discovered by or made known to the Contractor as a request for information.
- C. Nothing in this section shall relieve the Contractor of responsibility for its own errors, inconsistencies, and omissions.

2.05 Workmanship

- A. The Work shall be executed in accordance with the Contract Documents in a workmanlike manner. All materials used in the Work shall be furnished in sufficient quantities to facilitate the proper and expeditious execution of the Work and shall be new except as otherwise provided in the Contract Documents.
- B. Work for which no explicit quality of standards of materials and/or workmanship is defined in the Contract Documents shall be of best quality for the intended use and consistent with the quality of surrounding work and of the construction of the Project generally.
- C. All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with manufacturer's written instructions, unless specifically indicated otherwise in the Contract Documents.
- D. Where the Work is to fit with existing conditions or work to be performed by Others, the Contractor shall join the Work fully and completely with such conditions or work, unless otherwise specified.
- E. The Contractor shall be responsible for inspection of portions of the Work already performed to determine that such portions are in proper condition to receive subsequent Work.
- F. The Contractor shall study and compare all Drawings and verify all figures shown thereon before laying out or constructing the Work. The Contractor shall be responsible for errors in its work and the work of its Subcontractors that might reasonably have been avoided thereby. The Contractor shall establish and be responsible for the accuracy of all lines, grades, measurements, levels, column lines, wall and partition lines required by the various Subcontractors in laying out their Work and shall protect and preserve all permanent bench and other markers. Checking of the figures or layout by the Design Professional shall not relieve the Contractor of these responsibilities.

2.06 Material Furnished by the Owner or Others

- A. If the Work includes installation of materials or equipment furnished by the Owner or Others, it shall be the responsibility of the Contractor to examine the items so provided and thereupon handle, store, and install the items, unless otherwise provided in the Contract Documents, with such skill and care as to provide a satisfactory and proper installation. Loss or damage due to acts or omissions of the Contractor shall be the responsibility of the Contractor and may be deducted from any amounts due or to become due the Contractor. Any defects discovered in such materials or equipment shall be reported at once to the Owner. Following receipt of written notice from the Contractor of defects, the Owner shall promptly inform the Contractor what action, if any, the Contractor shall take with regard to the defects.

2.07 Tests and Inspections

- A. The Contractor shall schedule all tests, inspections, and approvals of the Work required by the Contract Documents, Law, or orders of authorities having jurisdiction at an appropriate time so as to not delay the progress of the Work. The Contractor shall give proper notice to all required parties of such tests, inspections, and approvals. If feasible, the Owner and Others may timely observe the tests at the normal place of testing. The Contractor shall bear all expenses associated with tests, inspections, and approvals required by the Contract Documents, which, unless otherwise agreed to, shall be conducted by an independent testing laboratory or entity retained by the Contractor, and approved by the Owner. Unless otherwise required by the Contract Documents, required certificates of testing, inspection, or approval shall be secured by the Contractor and promptly delivered to the Owner.
- B. If the Owner or appropriate authorities determine that tests, inspections, or approvals in addition to those required by the Contract Documents will be necessary, the Contractor shall arrange for the procedures and give timely notice to the Owner and others who may observe the procedures. Costs of the additional tests, inspections, or approvals are at the Owner's expense except as provided in the subsection below.
- C. If the procedures described in the two subsections immediately above indicate that portions of the Work fail to comply with the Contract Documents, the Contractor shall be responsible for costs of correction and retesting.

2.08 Warranty

- A. The Contractor warrants that all materials and equipment shall be new unless otherwise specified, of good quality, in conformance with the Contract Documents, and free from defective workmanship and materials. At the Owner's request, the Contractor shall furnish satisfactory evidence of the quality and type of materials and equipment furnished. The Contractor further warrants that the Work shall be free from material defects not intrinsic in the design or materials required in the Contract Documents. The Contractor's warranty does not include remedies for defects or damages caused by normal wear and tear during normal usage, use for a purpose for which the Project was not intended, improper or insufficient maintenance, modifications performed by the Owner or Others, or abuse. The Contractor's warranty shall commence on the Date of Substantial Completion of the Work. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective.

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- B. With respect to any portion of the Work performed after Substantial Completion, the Contractor's warranty obligation shall be extended by the period of time between Substantial Completion and the actual performance of the later Work.
- C. The Contractor shall obtain from its Subcontractors and Suppliers any special or extended warranties required by the Contract Documents. The Contractor's liability for such warranties shall be limited to the one-year correction period as provided in Section 2.09. After that period, the Contractor shall provide reasonable assistance to the Owner in enforcing the obligations of Subcontractors or Suppliers for such extended warranties.

2.09 Correction of Work Within One Year

- A. If, prior to Substantial Completion and within one year after the date of Substantial Completion of the Work, any Defective Work is found, the Owner shall promptly notify the Contractor in writing. Unless the Owner provides written acceptance of the condition, the Contractor shall promptly correct the Defective Work at its own cost and time and bear the expense of additional services required for correction of any Defective Work for which it is responsible. If within the one-year correction period the Owner discovers and does not promptly notify the Contractor or give the Contractor an opportunity to test or correct Defective Work as reasonably requested by the Contractor, the Owner waives the Contractor's obligation to correct the Defective Work as well as the Owner's right to claim a breach of the warranty with respect to that Defective Work.
- B. With respect to any portion of Work performed after Substantial Completion, the one-year correction period shall be extended by the period of time between Substantial Completion and the actual performance of the later Work. Correction periods shall not be extended by corrective work performed by the Contractor.
- C. If the Contractor fails to correct Defective Work within a reasonable time after receipt of written notice from the Owner prior to final payment, the Owner may correct it in accordance with the Owners right to carry out the Work. In such case, an appropriate Change Order shall be issued deducting the cost of correcting the Defective Work from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.
- D. The Contractor's obligations and liability, if any, with respect to any Defective Work discovered after the one-year correction period shall be determined by the Law. If, after the one-year correction period but before applicable limitation period has expired, the Owner discovers any Work which the Owner considers Defective Work, the Owner shall, unless the Defective Work requires emergency correction, promptly notify the Contractor, and allow the Contractor an opportunity to correct the Work if the Contractor elects to do so. If the Contractor elects to correct the Work, it shall provide written notice of such intent within fourteen (14) Days of its receipt of notice from the Owner and shall complete the correction of Work within a mutually agreed timeframe. If the Contractor does not elect to correct the Work, the Owner may have the Work corrected by itself or Others, and, if the Owner intends to seek recovery of those costs from the Contractor, the Owner shall promptly provide the Contractor with an accounting of the correction costs it incurs.
- E. If the Contractor's correction or removal of Defective Work causes damage to or destroys other completed or partially completed Work or existing buildings, the Contractor shall be responsible for the cost of correcting the destroyed or damaged property.

- F. The one-year period for correction of Defective Work does not constitute a limitation period with respect to enforcement of the Contractor's other obligations under the Contract Documents.
- G. At the Owners option and with the Contractor's agreement, the Owner may elect to accept Defective Work rather than require its removal and correction. In such case, the Contract Price shall be equitably adjusted for any diminution in the value of the Project caused by such Defective Work. Such adjustment shall be effected whether or not final payment has been made.

2.10 Correction of Covered Work

- A. On request of the Owner, Work that has been covered without a requirement that it be inspected prior to being covered shall be uncovered for the Owner's inspection. The Owner shall pay for the costs of uncovering and replacement if the Work proves to be in conformance with the Contract Documents, or if the defective condition was caused by the Owner or Others. If the uncovered Work proves to be defective, the Contractor shall pay the costs of uncovering and replacement.
- B. If any Work is covered contrary to requirements in the Contract Documents, the Owner may issue an order to uncover the Work for the Owner's observation and re-cover the Work all at the Contractor's expense and with no adjustment to the Contract Time.

2.11 Safety

- A. Safety Programs: The Contractor holds overall responsibility for safety programs. However, such obligation does not relieve the Subcontractors of their safety responsibilities or requirements to comply with the Law. The Contractor shall seek to avoid injury, loss, or damage to persons or property by taking reasonable steps to protect:
 - 1. Its employees and other persons at the Site;
 - 2. Materials and equipment stored at onsite or offsite locations for use in the Work; and
 - 3. Property located at the Site and adjacent to work areas, whether or not the property is part of the Site.
- B. The Contractor shall designate an individual at the Site in its employ as its safety representative. Unless otherwise identified by the Contractor in writing to the Owner, the Contractor's superintendent shall serve as its safety representative. When the Contractor is required to file an accident report with a public authority, the Contractor shall furnish a copy of the report to the Owner.
- C. The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of authorities having jurisdiction bearing on safety or persons or property or their protection from damage, injury, or loss.
- D. Damage or loss not insured under property insurance which may arise from the Work to the extent caused by negligent acts or omissions of the Contractor, or anyone for whose acts the Contractor may be liable, shall be promptly remedied by the Contractor.
- E. The Contractor shall erect and maintain, as required by existing conditions and performance of the Work, reasonable safeguards for safety and protection, including posting danger signs and other

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warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.

- F. When use or storage of explosives or other Hazardous Materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.
- G. If the Owner deems any part of the Work or Site unsafe, the Owner, without assuming responsibility for the Contractor's safety program, may require the Contractor to stop performance of the Work, take corrective measures satisfactory to the Owner, or both. If the Contractor does not adopt corrective measures, the Owner may perform them and deduct their cost from the Contract Price. The Contractor agrees to make no claim for damages, for an increase in the Contract Price or Contract Time based on the Contractor's compliance with the Owners reasonable request.

2.12 Emergencies

- A. In an emergency affecting the safety of persons or property, the Contractor shall act in a reasonable manner to prevent threatened damage, injury, or loss. Any change in the Contract Price or Contract Time resulting from the actions of the Contractor in an emergency situation shall be determined as provided for in Article 6.

2.13 Hazardous Materials

- A. The Contractor shall not be obligated to commence or continue Work until any Hazardous Material discovered at Site has been removed, rendered, or determined to be harmless by the Owner as certified by an independent testing laboratory and approved by the appropriate governmental agency.
- B. If after commencing the Work, Hazardous Material is discovered at the Site, the Contractor shall be entitled to immediately stop Work in affected area. The Contractor shall promptly report the condition to the Owner, the Design Professional, and, if required, the authority having jurisdiction.
- C. The Contractor shall not resume nor be required to continue any Work affected by any Hazardous Material without written mutual agreement between the Parties after the Hazardous Material has been removed or rendered harmless and only after approval, if necessary, of the authorities having jurisdiction.
- D. The Owner shall be responsible for retaining an independent testing laboratory to determine the nature of the material encountered and whether the material requires corrective measures or remedial action. Such measures shall be the sole responsibility of the Owner and shall be performed in a manner minimizing any adverse effect upon the Work.
- E. If the Contractor incurs additional costs or is delayed due to the presence or remediation of Hazardous Material, the Contractor shall be entitled to an equitable adjustment in the Contract Price, the Contract Time, or both.

2.14 Submittals

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- A. The Contractor shall submit to the Owner and the Design Professional all shop drawings, samples, product data, and similar submittals required by the Contract Documents for review and approval. The Contractor shall prepare and deliver its submittals in a manner consistent with the Construction Schedule and in such time and sequence so as not to delay the performance of the Work or the work of the Owner and Others. If the Contract Documents do not contain specific submittal requirements pertaining to portions of the Work, the Contractor agrees upon request to submit in a timely fashion to the Owner and Design Professional for review any shop drawings, samples, product data, or similar submittals as may reasonably be required by the Owner.
- B. The Contractor shall be responsible for the accuracy and conformity of its submittals. By submitting shop drawings, samples, product data, and similar submittals, the Contractor represents to the Owner that the Contractor has:
 - 1. Reviewed and approved them;
 - 2. Determined and verified materials, field measurements and field construction criteria related thereto, or will do so; and
 - 3. Checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
- C. The Contractor shall perform all Work strictly in accordance with approved submittals. Approval of submittals is not an authorization to perform changed work, unless the procedures of Article 6 are followed. Approval does not relieve the Contractor from responsibility for Defective Work resulting from errors or omissions on the approved shop drawings.
- D. No substitutions shall be made in the Work unless permitted in the Contract Documents and then only after the Contractor obtains approvals required under the Contract Documents for substitutions. All such substitutions shall be promptly memorialized in a Change Order following approval by the Owner and, if applicable, the Design Professional to provide for an adjustment in the Contract Price or Contract Time.

2.15 Design Delegation

- A. If the Contract Documents specify that the Contractor is responsible for the design of a particular system or component to be incorporated into the Project, the Owner shall provide all required performance and design criteria. The Contractor shall not be responsible for the adequacy of such performance and design criteria.
- B. As required by Law, the Contractor shall procure design services and certifications necessary to satisfactorily complete the Work from a licensed design professional. The signature and seal of the Contractor's design professional shall appear on all drawings, calculations, specifications, certifications, shop drawings, and other submittals related to the Work designed or certified by the Contractor's design professional.

2.16 Site Conditions

- A. Site Visit: The Contractor acknowledges that it has visited, or has had the opportunity to visit, the Site to visually inspect the general and local conditions which could affect the Work.

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- B. Concealed or Unknown Site Conditions: If the conditions encountered at the Site are (a) subsurface or other physical conditions materially different from those indicated in the Contract Documents, or (b) unusual and unknown physical conditions materially different from conditions ordinarily encountered and generally recognized as inherent in Work provided for in the Contract Documents, the Contractor shall stop affected Work after the condition is first observed and give prompt written notice of the condition to the Owner and the Design Professional. The Contractor shall not be required to perform any Work relating to the unknown condition without the written mutual agreement of the parties. Any change in the Contract Price or the Contract Time as a result of the unknown condition shall be determined as provided in Article 6.
- C. The Owner maintains possession of the premises and any improvements made by the Contractor. Under the Contract Documents, the Owner grants the Contractor the right to enter and use the premises. The Contractor shall confine its apparatus, the storage of materials, and the operations of the Contractor's workers to limits indicated by Law, ordinance, the Contract Documents, permits, and/or directions of the Owner and shall not unreasonably encumber the premises with the Contractor's materials or equipment.
- D. The Contractor shall remove snow or ice within the limits of the Site indicated in the Contract Documents that might result in damage or delay.

2.17 Permits, Fees, Notices and Compliance with Laws

- A. Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by authorities having jurisdiction necessary for proper execution and completion of the Work that are customarily secured after execution of the Agreement and legally required at the time bids are received or negotiations concluded.
- B. The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of authorities having jurisdiction applicable to performance of the Work.
- C. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules, and regulations, or lawful orders of authorities having jurisdiction, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

2.18 Cutting, Fitting, and Patching

- A. The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.
- B. The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Others by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or Others except with written consent of the Owner and Others. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or Others, its consent to cutting or otherwise altering the Work.

2.19 Cleaning Up

- A. The Contractor shall regularly remove debris and waste materials at the Site resulting from the Work. Prior to discontinuing Work in an area, the Contractor shall clean the area and remove all rubbish and its construction equipment, tools, machinery, waste, and surplus material. The Contractor shall minimize and confine dust and debris resulting from construction activities. At the completion of the Work, the Contractor shall remove from the Site all construction equipment, tools, surplus materials, waste materials, and debris. All debris from the Project shall be cleaned up daily and removed from the Site at least on a weekly basis.
- B. If the Contractor fails to commence compliance with cleanup duties within two (2) Business Days after written notification from the Owner of non-compliance, the Owner may implement appropriate cleanup measures without further notice and shall deduct the reasonable costs from any amounts due or to become due the Contractor in the next payment period.

2.20 Access to Work

- A. The Contractor shall facilitate the access of the Owner, Design Professional, and Others to Work in progress.

2.21 Compliance with Laws

- A. The Contractor shall comply with the Law at its own costs. The Contractor shall be liable to the Owner for all loss, cost, or expense attributable to any acts or omissions by the Contractor, its employees, subcontractors, and agents for failure to comply with the Law, including fines, penalties, or corrective measures. However, liability under this subsection shall not apply if prior approval by appropriate authorities and the Owner is received.
- B. The Contract Price or Contract Time shall be equitably adjusted by Change Order for additional costs or time needed resulting from any changes in Law, including increased taxes, enacted after the date of the Agreement.

2.22 Royalties, Patents, and Copyrights

- A. The Contractor shall pay all royalties and license fees which may be due on the inclusion of any patented or copyrighted materials, methods, or systems selected by the Contractor and incorporated in the Work. The Contractor shall defend, indemnify, and hold the Owner harmless from all suits or claims for infringement of any patent rights or copyrights arising out of such selection.

ARTICLE 3 – OWNER'S RESPONSIBILITIES

3.01 Information and Services

- A. The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

3.02 Site Information

- A. To the extent the Owner has obtained or is required elsewhere in the Contract Documents to obtain, Site information, the Owner shall furnish surveys describing physical characteristics, legal limitations, and utility locations for the Site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information provided by the Owner but shall exercise proper precautions relating to the safe performance of the Work.
- B. The Owner shall provide tests, inspections, and other reports dealing with environmental matters, Hazardous Material, and other existing conditions, including structural, mechanical, and chemical tests, required by the Contract Documents or by Law.

3.03 Permits, Fees, and Approvals

- A. Except for those permits and fees related to the Work which are the responsibility of the Contractor, the Owner shall secure and pay for necessary approvals, easements, assessments, and fees required for the development, construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

3.04 Mechanics and Construction Lien Information

- A. The Owner shall furnish to the Contractor within fifteen (15) Days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

3.05 Owner's Representative

- A. The Owner's Representative shall be fully acquainted with the Project and shall have authority to act as the Owner's agent in all matters requiring the Owner's approval, authorization, or written notice. If the Owner changes its Representative or its Representative's authority, the Owner shall immediately notify the Contractor in writing.

3.06 Owner's Right to Stop the Work

- A. If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents or repeatedly fails to carry out the Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity.

3.07 Owner's Right to Carry Out the Work

- A. If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may,

without prejudice to other remedies the Owner may have, correct such default or neglect. The Owner may, pursuant to Section 7.3, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Design Professional's additional services made necessary by such default, neglect, or failure. If current or future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

3.08 Submittals

- A. The Owner or its Design Professional will review and approve, or take other appropriate action upon, the Contractor's submittals such as shop drawings, product data, and samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Owner's action will be taken with reasonable promptness while allowing sufficient time in the Owner's judgement to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Owner's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Owner's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

ARTICLE 4 – SUBCONTRACTS

4.01 Award of Subcontracts and Other Contracts for Portions of the Work

- A. Promptly after the award of the Agreement, the Contractor shall provide the Owner and, if directed, the Design Professional with a written list of the proposed Subcontractors and significant Suppliers. If the Owner has a reasonable objection to any proposed Subcontractor or Supplier, the Owner shall notify the Contractor in writing. Failure to promptly object shall constitute acceptance.
- B. If the Owner has reasonably and promptly objected, the Contractor shall not contract with the proposed Subcontractor or Supplier, and the Contractor shall propose another acceptable Subcontractor or Supplier to the Owner. No adjustment in the Contract Price or Contract Time shall be made because of such substitution.
- C. The Contractor shall not change a Subcontractor or Supplier previously selected without the prior written approval of the Owner.

4.02 Binding of Subcontractors and Suppliers

- A. The Contractor agrees to bind every Subcontractor and Supplier (and require every Subcontractor to so bind its subcontractors and suppliers) to the Contract Document's applicable provisions to that portion of the Work. Each subcontract agreement shall preserve and protect the rights of the Owner and its Design Professional under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the

Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors.

4.03 Contingent Assignment of Subcontracts

- A. If the Agreement is terminated, each subcontract and supply agreement shall be assigned by the Contractor to the Owner, subject to the prior rights of any surety, provided that:
 - 1. The Agreement is terminated by the Owner pursuant to Sections 9.03 or 9.04; and
 - 2. The Owner accepts such assignment after termination by notifying the Contractor and Subcontractor or Contractor and Supplier in writing and assumes all rights and obligations of the Contractor pursuant to each subcontract or supply agreement.
- B. If the Owner accepts such an assignment, and the Work has been suspended for more than thirty (30) consecutive Days, following termination, if appropriate, the Subcontractor's or Supplier's compensation shall be equitably adjusted as a result of the suspension.

ARTICLE 5 – TIME

5.01 General

- A. Time is of the essence with regard to the obligations of the Contract Documents. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.
- B. Unless instructed by the Owner in writing, the Contractor shall not knowingly commence the Work before the effective date of insurance and Bonds to be provided by the Contractor as required by the Contract Documents.
- C. Date of Commencement: The Contractor shall commence the Work after the Notice to Proceed has been received by the Contractor. The Notice to Proceed shall be issued immediately after the Agreement has been approved by the Governor and Council and shall establish the actual construction start date. Failure to commence the Work within fifteen (15) Calendar Days after the Date of Commencement shall be considered a Default of the Agreement. If the Date of Commencement is later than the advertised start date, the date of Final Completion shall be extended by an equivalent number of Days.

5.02 Construction Schedule

- A. Before submitting the first application for payment, the Contractor shall submit to the Owner, and if directed, the Design Professional, a Construction Schedule showing the dates on which the Contractor plans to commence and complete various parts of the Work, including dates on which information and approvals are required from the Owner. Except as directed by the Owner, the Contractor shall comply with the approved Construction Schedule. Unless otherwise agreed, the Construction Schedule shall be formatted in a detailed precedence-style critical path method that (a) provides a graphic representation of all activities and events, including float values that will affect the critical path of the Work, and (b) identifies dates that are critical to ensure timely and orderly completion of the Work.

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- B. The Contractor shall revise the Construction Schedule at appropriate intervals as required by the conditions of the Work and Project. At a minimum, an updated schedule shall be submitted with each application for payment, and within seven (7) Days following receipt of information by the Contractor, which the Contractor believes may result in a change of completion date.

5.03 Delays and Extensions of Time

- A. If the Contractor is delayed at any time in the commencement or progress of the Work by any cause beyond the control of the Contractor, the Contractor shall be entitled to an equitable extension of the Contract Time. Examples of causes beyond the control of the Contractor include, but are not limited to, the following:
1. Acts or omissions of the Owner, Design Professional, or Others.
 2. Changes in the Work or the sequencing of the Work ordered by the Owner or arising from decisions of the Owner that impact the time of performance of the Work.
 3. Encountering Hazardous Materials or concealed or unknown conditions.
 4. Delay authorized by the Owner pending dispute resolution or suspension by the Owner under Section 9.01.
 5. Transportation delays not reasonably foreseeable.
 6. Labor disputes not involving the Contractor.
 7. General labor disputes impacting the Project but not specifically related to the Site.
 8. Fire.
 9. Terrorism.
 10. Epidemics.
 11. Adverse governmental actions.
 12. Unavoidable accidents or circumstances.
 13. Adverse weather conditions not reasonably anticipated. Such conditions do not include typical weather conditions of remote mountain top sites.
- B. The Contractor shall submit any requests for equitable extensions of the Contract Time in accordance with Article 6. The Contractor shall have the burden of demonstrating such impact and shall furnish to the Owner such documentation relating thereto as the Owner may reasonably require.
- C. If the Contractor incurs additional costs as a result of a delay that is caused by items 1 through 13 above, the Contractor shall be entitled to an equitable adjustment in the Contract Price.
- D. If delays to the Work are encountered for any reason, the Contractor shall provide prompt written notice to the Owner within five (5) Days of the cause of such delays after the Contractor first recognized the delay. The Parties agree to take reasonable steps to mitigate the effect of such delays.
- E. Any changes in time that extend past Completion Date of the Contract, shall be formalized in a Change Order in accordance with Article 6, and subsequent Contract Amendment for approval by Governor and Council.

5.04 Liquidated Damages

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- A. The Contractor understands that if the date of Final Completion established in the Agreement, as may be amended by subsequent Change Order and approval by Governor and Council, is not attained, the Owner will suffer damages which are difficult to determine and accurately specify. The Contractor agrees that if the date of Final Completion is not attained, the Contractor shall pay the Owner the amount specified in the below Section as liquidated damages, and not as a penalty, for each Day that completion extends beyond the date of Final Completion. Should the amount of money otherwise due the Contractor be less than the amount of such liquidated damages, the Contractor and its Surety shall be liable to the Owner for such deficiency. When final acceptance of the Work has been duly made by the Owner, any liquidated damage charges shall end.
- B. Allowing the Contractor to continue executing the Work after the date of Final Completion, shall in no way obligate the Owner to waive any of its rights under the Agreement.
- C. Schedule of Liquidated Damages: The fixed, agreed, liquidated damages shall be assessed in accordance with the following:

<u>Price Limitation</u>		<u>Amount of Liquidated Damages per Day</u>
From more than:	To and Including:	
\$0.00	\$25,000.00	\$300.00
\$25,000.00	\$50,000.00	\$400.00
\$50,000.00	\$100,000.00	\$500.00
\$100,000.00	\$500,000.00	\$600.00

ARTICLE 6 – CHANGES

6.01 General

- A. Changes in the Work that are within the general scope of the Agreement shall be accomplished, without invalidating the Agreement, by Change Order, and Construction Change Directive.

6.02 Change Orders

- A. The Contractor may request, or the Owner may order, changes in the Work or the timing or sequencing of the Work that impacts the Contract Price or the Contract Time. All such changes in the Work that affect Contract Price or Contract Time shall be formalized in a Change Order and processed in accordance with this Article.
- B. For changes in the Work, the Parties shall negotiate an appropriate adjustment to the Contract Price or the Contract Time, in good faith and conclude negotiations as expeditiously as possible. Acceptance of the Change Order and any adjustment in the Contract Price or Contract Time shall not be unreasonably withheld.
- C. The Contractor shall not be obligated to perform changes in the Work that impact Contract Price or Contract Time until a Change Order has been executed or a written Construction Change Directive has been issued.

6.03 Construction Change Directives

- A. The Owner may issue a written Construction Change Directive directing a change in the Work before agreeing on an adjustment to Contract Price or Contract Time or directing the Contractor to perform Work that the Owner believes is not a change. If the Parties disagree that the Construction Change Directive work is within the scope of the Work, the Contractor shall perform the disputed Work and furnish the Owner with an estimate of the costs to perform the disputed work in accordance with Owner's interpretations.
- B. The Parties shall negotiate expeditiously and in good faith for appropriate adjustments, as applicable, to the Contract Price or the Contract Time arising out of a Construction Change Directive. As the directed Work is performed, the Contractor shall submit its costs for such Work with its application for payment beginning with the next application for payment within thirty (30) Days of the issuance of the Construction Change Directive. If there is a dispute as to the cost to the Owner, the Parties shall resolve the disputed amount, subject to the requirements of Article 10. Undisputed amounts may be included in applications for payment and shall be paid by the Owner in accordance with the Agreement.
- C. When the Parties agree upon the adjustment in the Contract Price or the Contract Time, for a change in the Work directed by a Construction Change Directive, such agreement shall be the subject of a Change Order. The Change Order shall include all outstanding Construction Change Directives on which the Parties have reached agreement on Contract Price or Contract Time issued since the last Change Order.

6.04 Determination of Cost

- A. An increase or decrease in the Contract Price or the Contract Time resulting from a change in the Work shall be determined as follows:
 - 1. A mutually accepted lump sum properly itemized and supported by sufficient substantiating data, as determined by the Owner, to permit evaluation.
 - 2. If the price change is an increase in the Contract Price, and the Work is performed by the Contractor and not a Subcontractor, it shall include the following indirect costs for Work performed by the Contractor: Workmen's Compensation and Employee Liability, and Unemployment and Social Security Taxes.
 - a. In addition to the above indirect costs, the Contractor shall be allowed a markup not to exceed ten percent (10%). This markup shall be all inclusive for overhead, supervision, and profit.
 - 3. If the price change is an increase in the Contract Price, and the Work is performed by both the Contractor and a Subcontractor, the Contractor shall be allowed a markup of ten percent (10%) on that portion of the Work performed by the Contractor, and a markup of five percent (5%) on the portion of the Work performed by the Subcontractor. The same percentages shall apply to Sub-subcontractors.
 - 4. On any change that involves a decrease in the Contract Price, no overhead and profit shall be figured.

6.05 Changes Notice

- A. Except as provided in Subsection 5.03 C for any claim for an increase in the Contract Price or Contract Time, the Contractor shall give the Owner written notice of the claim within fourteen (14)

Days after the occurrence giving rise to the claim or within fourteen (14) Days after the Contractor first recognizes the condition giving rise to the claim, whichever is later. Except in an emergency, notice shall be given before proceeding with the Work. Thereafter, the Contractor shall submit written documentation of its claim, including appropriate supporting documentation, within twenty-one (21) Days after giving notice, unless the Parties mutually agree upon a longer period of time. The Owner shall respond in writing denying or approving the Contractor's claim no later than fourteen (14) Days after receipt of the Contractor's claim. Owner's failure to so respond shall be deemed a denial of the claim. Any change in the Contract Price or the Contract Time resulting from such claim shall be authorized by Change Order.

6.06 Incidental Changes

- A. The Owner may direct the Contractor to perform incidental changes in the Work, upon concurrence with the Contractor that such changes do not involve adjustments in the Contract Price or Contract Time. Incidental changes shall be consistent with the scope and intent of the Contract Documents. The Owner shall initiate an incidental change in the Work by issuing a written order to the Contractor. Such written notice shall be carried out promptly and is binding on the Parties.

ARTICLE 7 – PAYMENT

7.01 Schedule of Values

- A. Within fifteen (15) Days of receiving the Notice to Proceed and before the first application for payment, the Contractor shall submit to the Owner, for approval, a schedule of values allocating the Contract Price to various portions of the Work. This schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Owner may require. Upon approval by the Owner, this schedule shall be used as the basis for reviewing the Contractor's applications for payment and shall be revised if later found by the Owner to be inaccurate.

7.02 Progress Payments

- A. Applications for Payment: The Contractor shall submit to the Owner and, if directed, the Design Professional a monthly application for payment no later than the first Day of the calendar month for the preceding calendar month. Contractor's applications for payment shall be itemized and supported by the Contractor's schedule of values based on a percentage of completion and shall include any other substantiating data as required by the Agreement. Applications for payment shall be notarized and include payment requests on account of properly authorized Change Orders or Construction Change Directives. The Owner shall pay the amount otherwise due on any payment application no later than thirty (30) Days after the Contractor has submitted a complete and accurate payment application, or such shorter time period as required by applicable state statute. The Owner may deduct from any progress payment amounts that may be retained pursuant to Subsection 7.02 D.
- B. Stored Materials and Equipment: Unless otherwise provided in the Contract Documents, applications for payment may include materials and equipment not yet incorporated into the Work but delivered to and suitably stored onsite including applicable insurance, storage, and costs incurred transporting the materials to an offsite storage facility. Approval of payment applications for stored materials and equipment stored offsite shall be conditioned on a submission by the Contractor of bills of sale and proof of required insurance, or such other documentation satisfactory

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to the Owner to establish proper valuation of the stored materials and equipment, the Owner's title to such materials and equipment, and to otherwise protect the Owner's interest therein, including transportation to the Site.

C. Lien Waivers and Liens

1. Partial Lien Waivers and Affidavits: If required by the Owner, as a prerequisite for payment, the Contractor shall provide partial lien and claim waivers in the amount of the application for payment and affidavits from its Subcontractors and Suppliers for the completed Work. Such waivers shall be conditional upon payment. In no event shall the Contractor be required to sign an unconditional waiver of lien or claim, either partial or final, prior to receiving payment or in an amount in excess of what it has been paid.
2. Removing Liens: If the Owner has made payments in the time required by this article, the Contractor shall, within thirty (30) Days after filing, cause the removal of any liens filed against the premises or public improvement fund by any party or parties performing labor or services or supplying materials in connection with the Work. If the Contractor fails to take such action on a lien, the Owner may cause the lien to be removed at the Contractor's expense, including bond costs and reasonable attorney's fees. This subsection shall not apply if there is a dispute pursuant to Article 10 relating to the subject matter of the lien.

- D. Retainage: From each progress payment made prior to Substantial Completion, the Owner shall retain ten percent (10%) of the amount otherwise due after deduction of any amounts as provided in Section 7.02, and in no event shall such percentage exceed any applicable statutory requirements.

7.03 Adjustment of Contractor's Payment Application

- A. The Owner may adjust or reject a payment application or nullify a previously approved payment application, in whole or in part, as may reasonably be necessary to protect the Owner from loss or damage based upon the following, to the extent that the Contractor is responsible under the Agreement:
1. The Contractor's repeated failure to perform the Work as required by the Contract Documents;
 2. Except as accepted by the insurer providing builders risk or other property insurance covering the project, loss or damage arising out of or relating to the Agreement and caused by the Contractor to the Owner or to Others to whom the Owner may be liable;
 3. The Contractor's failure to properly pay Subcontractors and Suppliers following receipt of such payment from the Owner;
 4. Rejected, nonconforming or Defective Work not corrected in a timely fashion;
 5. Reasonable evidence of delay in performance of the Work such that the Work will not be completed within the Contract Time;
 6. Reasonable evidence demonstrating that the unpaid balance of the Contract Price is insufficient to fund the cost to complete the Work; and
 7. Uninsured third-party claims involving the Contractor, or reasonable evidence demonstrating that third-party claims are likely to be filed unless and until the Contractor furnishes the Owner with adequate security in the form of a surety bond, letter of credit, or other collateral or commitment sufficient to discharge such claims if established.

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- B. No later than seven (7) Days after receipt of an application for payment, the Owner shall give written notice to the Contractor, at the time of disapproving or nullifying all or part of an application for payment, stating its specific reasons for such disapproval or nullification, and the remedial actions to be taken by the Contractor in order to receive payment. When the above reasons for disapproving or nullifying an application for payment are removed, payment will be promptly made for the amount previously withheld.

7.04 Acceptance of Work

- A. Neither the Owner's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of Work not complying with the Contract Documents.

7.05 Payment Delay

- A. If for any reason not the fault of the Contractor, the Contractor does not receive a progress payment from the Owner within seven (7) Days after the time such payment is due, then the Contractor, upon giving seven (7) Days written notice to the Owner, and without prejudice to and in addition to any other legal remedies, may stop Work until payment of the full amount owing to the Contractor has been received.

7.06 Substantial Completion

- A. The Contractor shall notify the Owner and, if directed, the Design Professional, when it considers Substantial Completion of the Work or a designated portion to have been achieved. The Owner, with the assistance of its Design Professional, shall promptly conduct an inspection to determine whether the Work or its designated portion can be occupied or used for its intended use by the Owner without excessive interference in completing any remaining unfinished Work. If the Owner determines that the Work or designated portion has not reach Substantial Completion, the Owner shall promptly compile a list of items to be completed or corrected so the Owner may occupy or use the Work or designated portion for its intended use. The Contractor shall promptly complete all items on the list.
 - 1. The Contractor's notification of Substantial Completion shall include (a) a list of items to be completed or corrected, and (b) all permits, certificates, and special warranties required by the Contract Documents, endorsed by the Contractor and in a form reasonably acceptable to the Owner.
- B. When Substantial Completion of the Work or a designated portion is achieved, the Owner or Design Professional shall prepare a Certificate of Substantial Completion establishing the date of Substantial Completion and the respective responsibilities of each Party for interim items such as security, maintenance, utilities, insurance, and damage to the Work and fixing the time for completion of all items on the list accompanying the Certificate of Substantial Completion. In the absence of a clear delineation of responsibilities, the Owner shall assume all responsibilities for items such as security, maintenance, utilities, insurance, and damage to the Work. The Certificate of Substantial Completion shall also list any items to be completed or corrected and establish the time for their completion or correction.

- C. Unless otherwise provided in the Certificate for Substantial Completion, warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or a designated portion.
- D. Upon the Owner's acceptance of Substantial Completion, the Owner shall pay to the Contractor the remaining retainage held by the Owner for the Work described in the Certificate of Substantial Completion, less a sum equal to two hundred percent (200%) of the estimated cost of completing or correcting remaining items on that part of the Work, as agreed to by the Parties as necessary to achieve Final Completion. The Owner shall pay the Contractor monthly the amount retained for unfinished items as each item is completed.

7.07 Partial Occupancy or Use

- A. The Owner may occupy, or use completed or partially completed portions of the Work when:
 - 1. The portion of the Work is designated in a Certificate of Substantial Completion;
 - 2. Appropriate insurer(s) consent to the occupancy or use, and
 - 3. Appropriate authorities having jurisdiction authorize the occupancy or use.

7.08 Final Completion and Final Payment

- A. Upon notification from the Contractor that the Work is complete and ready for final inspection and acceptance, the Owner with the assistance of its Design Professional shall promptly conduct an inspection to determine if the Work has been completed and is acceptable under the Contract Documents.
- B. When Final Completion has been achieved, the Contractor shall prepare for the Owner's written acceptance a final application for payment stating that to the best of the Contractor's knowledge, and based on the Owner's inspections, the Work has reached Final Completion in accordance with the Contract Documents.
- C. Final payment of the balance of the Contract Price shall be made to the Contractor within thirty (30) Days after the Contractor has submitted a complete and accurate application for final payment, including submissions required under the subsection below.
- D. Final payment shall be due on the Contractor's submission of the following to the Owner:
 - 1. An affidavit declaring any indebtedness connected with the Work to have been paid, satisfied, or to be paid with the proceeds of final payment, so as not to encumber the Owner's property;
 - 2. As-built record drawings, manuals, copies of warranties, and all other close-out documents required by the Contract Documents;
 - 3. Release of any liens, conditioned on final payment being received;
 - 4. Consent of any surety; and
 - 5. Any outstanding known and unreported accidents or injuries experienced by the Contractor or its Subcontractors at the Site.
- E. If, after Substantial Completion of the Work, the Final Completion of a portion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the balance due for

portions of the Work fully completed and accepted. If the remaining contract balance for Work not fully completed and accepted is less than the retained amount prior to payment, the Contractor shall submit to the Owner and, if directed, the Design Professional, the written consent of any surety to payment of the balance due for portions of the Work that are fully completed and accepted. Such payment shall not constitute a waiver of claims, but otherwise shall be governed by these final payment provisions.

- F. Contractor Acceptance of Final Payment: Unless the Contractor provides written identification of unsettled claims with an application for final payment, its acceptance of final payment constitutes a waiver of all claims by the Contractor arising out of or related to the Agreement or the Work.

ARTICLE 8 – INDEMNITY, INSURANCE, AND BONDS

8.01 Indemnity

- A. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Owner's officers, directors, members, consultants, agents, and employees, the Design Professional, and Others (the Indemnitees) from all claims for bodily injury and property damage, other than to the Work itself and other property insured, including reasonable attorney's fees, costs, and expenses, that may arise from the performance of the Work, but only to the extent caused by the negligent acts or omissions of the Contractor, Subcontractors, or anyone employed directly or indirectly by any of them or by anyone for whose acts any of them may be liable.
- B. No Limitation on Liability: The limits and types of insurance set forth in this Article are the minimum required amounts and in no way limit the liability of the Contractor or Subcontractors. In any and all claims against the Indemnitees by any employee of the Contractor, anyone directly or indirectly employed by the Contractor or anyone for whose acts the Contractor may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the Contractor under workers' compensation acts, disability benefit acts, or other employment benefit acts.

8.02 Insurance

- A. The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement and Section 8.03 "Insurance Requirements."
- B. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where Project is located.
- C. The Owner, its trustees, their officers, employees, representatives, and agents including the Design Professional, shall be included as additional insureds (except under worker's compensation and employer's liability insurance) for and relating to the Work to be performed by the Contractor.
- D. Proof of Coverage: Certificates of Insurance, as evidence of the insurance required by these Contract Documents, shall be submitted by the Contractor to the Owner prior to the date of the Agreement and in all cases prior to the commencement of Work.

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- E. Subcontractor Insurance: The Contractor shall either require subcontractors to carry the insurance or the Contractor shall insure the activities of the Subcontractors in the types and form of insurance required under the Contract Documents, and in such amounts as the Contractor shall deem appropriate.
- F. Notice of Cancellation or Expiration: Within ten (10) Days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide required coverage.
- G. Workers Compensation Insurance: Workers compensation insurance is required for all workers on the Site of this Project. Per RSA 21-I:80-VI, at the outset of Work on any State construction project, the Contractor shall provide to the Owner a current list of all Subcontractors and Sub-subcontractors the Contractor has agreed to use on the Project, with a record of the entity to whom such Subcontractor is insured for workers compensation purposes. This list shall be posted on the Project Site and updated as needed to reflect any new Subcontractors or Sub-subcontractors.
 - 1. If it is determined that a Subcontractor or Sub-subcontractor is present on the Site without their name and direct contracting relationship being posted in a visible location at the Site, the Contractor shall require the Subcontractor or Sub-subcontractor to provide the information within thirty-six (36) hours and to post the information in a visible location at the Site. If the information is not provided within thirty-six (36) hours of its request, the Contractor shall suspend the Subcontractor or Sub-subcontractor until the information is provided and posted.

8.03 Insurance Requirements

- A. Workers Compensation Insurance: In accordance with RSA 281-A.
 - 1. Employers' Liability:
 - a. \$100,000 Each accident
 - b. \$500,000 Disease-policy limit
 - c. \$100,000 Disease-each employee
- B. Commercial General Liability Insurance: Occurrence Form Policy; Include full Contractual Liability, Broad Form Property Damage, Explosion, Collapse, and Underground Hazard coverage
 - 1. Limits of Liability:
 - a. \$1,000,000 Each Occurrence; Bodily Injury & Property Damage
 - b. \$2,000,000 General Aggregate; Include Per Project Aggregate Endorsement
 - c. \$2,000,000 Products/Completed Operations Aggregate
- C. Owners Protective Liability:
 - 1. Limits of Liability:
 - a. \$2,000,000 Each Occurrence
 - b. \$3,000,000 Aggregate

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- D. Commercial Automobile Liability: Covering all motor vehicles including owned, hired, borrowed, and non-owned vehicles
 - 1. Limits of Liability:
 - a. \$1,000,000 Combined Single Limit for Bodily Injury & Property Damage
- E. Commercial Umbrella Liability:
 - 1. Limits of Liability:
 - a. \$1,000,000 Each Occurrence
 - b. \$1,000,000 Aggregate
- F. Other Insurance: If blasting and/or demolition are required by the Contract Documents, the Contractor or Subcontractor shall obtain the respective coverage for those activities and shall furnish to the Owner a Certificate of Insurance evidencing the required coverage's prior to commencement of any operations involving blasting and/or demolition.

8.04 Property Insurance

- A. Builder's Risk: The Contractor shall insure the Work included in the Contract Documents, including modifications and Change Orders, on an "All Risk" basis, on a one hundred percent (100%) completed value basis of the Contract, as modified. Builder's Risk coverage shall include materials located at the Contractor's premises, onsite, in-transit, and at any temporary site. The policy by its own terms or by endorsement shall specifically permit partial or beneficiary occupancy prior to completion or acceptance of the entire Work. The policy shall be in the name of the State of New Hampshire Department of Natural and Cultural Resources and the Contractor. The policy shall provide for the inclusion of the names of all other Contractors, Subcontractors, and Others employed on the premises as insureds. The policy shall stipulate that the insurance company shall have no right of subrogation against any Contractors, Subcontractors, or other parties employed on the premises.

8.05 Owner's Insurance

- A. Owner Liability Insurance: The Owner shall either self-insure or obtain and maintain its own liability insurance for protection against claims arising out of the performance of the Agreement, including, without limitation, loss of use and claims, losses, and expenses arising out of the Owner's acts or omissions.

8.06 Bonds

- A. Performance and Payment Bond: In the event a bid is \$75,000 or more, the Contractor shall furnish security by bond or otherwise in an amount equal to 100% of the Contract Price guaranteeing performance and payment. The payment security shall meet the requirements of New Hampshire RSA 447:16.
- B. The fully executed performance and payment bond must be returned to the Owner a minimum of fifteen (15) Days prior to the Date of Commencement for the Work.

8.07 Professional Liability Insurance

- A. To the extent the Contractor is required to procure design services in accordance with Section 2.15, the Contractor shall require its design professional to obtain professional liability insurance for claims arising from the negligent performance of design services under the Agreement, with a company reasonably satisfactory to the Owner, including coverage for all professional liability caused by any consultants to the Contractor's design professional, written for not less than the limits required for general liability. The Contractor's design professional shall be responsible for payment of any applicable retention or deductible. The Professional Liability Insurance shall contain a retroactive date providing prior acts coverage sufficient to cover all services performed by the Contractor's design professional for the Project. Coverage shall be continued in effect for eight years following the date of Substantial Completion.

ARTICLE 9 – SUSPENSION, NOTICE TO CURE, AND TERMINATION

9.01 Suspension by Owner for Convenience

- A. The Owner may, without cause, order the Contractor in writing to suspend, delay, or interrupt the performance of the Work, for the convenience of the Owner and not due to any act or omission of the Contractor or any person or entity for whose acts or omissions the Contractor may be liable, then the Contractor shall immediately suspend, delay, or interrupt that portion of the Work for the time period ordered by the Owner. The Contract Price and the Contract Time shall be equitably adjusted by Change Order for the cost and delay resulting from any such suspension.
- B. Any action taken by the Owner that is permitted by any other provision of the Contract Documents and that result in a suspension of part of the Work does not constitute a suspension of Work under this section.

9.02 Termination by Owner for Convenience

- A. The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.
- B. Upon receipt of Notice from the Owner of such termination for the Owner's convenience, the Contractor shall:
1. Cease operations as directed by the Owner in the notice;
 2. Take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
 3. Except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.
- C. In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

9.03 Default

- A. The Owner may terminate this Contract for default if the Contractor materially breaches this Contract by:

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1. Refusing, failing, or being unable to commence the Work within the time specified in the Contract Documents
 2. Refusing, failing, or being unable to properly manage the Work;
 3. Refusing, failing, or being unable to supply the Work with sufficient numbers of properly skilled workers, proper materials, or construction equipment, or to maintain the Construction Schedule;
 4. Refusing, failing, or being unable to make prompt payment to Subcontractors or Suppliers;
 5. Disregarding Laws, ordinances, rules, regulations, or orders of any authority having jurisdiction or quasi-public authority having jurisdiction over the Project; or,
 6. Refusing, failing, or being unable to substantially perform in accordance with the terms of the Agreement and Contract Documents, as determined by the Owner, or as otherwise defined elsewhere herein.
- B. Upon the occurrence of any of the events described in Section 9.03 A, the Owner shall give written Notice to the Contractor setting forth the nature of the default and requesting cure within seven (7) Days from the date of notice. Within seven (7) Days of receipt of the Owner's notice of default, the Contractor shall furnish the Owner with either:
1. Written evidence that the default has been cured; or,
 2. A written plan demonstrating steps to be taken by the Contractor to cure the default and accomplish completion of the Work in accordance with the requirements of the Contract Documents and within established cost and schedule requirements.

9.04 Owner's Remedies

- A. If the Contractor fails to cure the default or provide a written plan to cure the default satisfactory to the Owner, or if the Contractor fails to expeditiously continue such cure until complete, the Owner may give written Notice to the Contractor of immediate termination, and the Owner, without prejudice to any other rights or remedies, may take any or all of the following actions:
1. Exclude the Contractor from the Site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
 2. Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.
 3. Require the Contractor to assign the Contractor's right, title, and interest in any or all of the Contractor's subcontracts or orders to the Owner.
- B. When the Owner terminates the Agreement for default, the Owner shall be entitled to collect from the Contractor all direct, indirect, and consequential damages suffered by the Owner on account of the Contractor's default, including without limitation additional services and expenses of the Design Professional and attorney's fees and expenses made necessary thereby. The Owner shall be entitled to hold all amounts due the Contractor at the date of termination until all of the Owner's damages have been established, and to apply such amounts to such damages. In no case shall the Contractor be entitled to receive further payment until the Work is finished.

9.05 Contractor's Right to Terminate

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- A. Upon seven (7) Days written notice to the Owner, the Contractor may terminate the Agreement if the Work has been stopped for a thirty (30) Day period through no fault of the Contractor for any of the following reasons:
1. Under court order or order of other governmental authorities having jurisdiction;
 2. As a result of the declaration of a national emergency or other governmental act during which, through no act or fault of the Contractor, materials are not available; or
 3. Suspension by the Owner for convenience pursuant to Section 9.01
- B. In addition, if the Work is stopped for a period of 60 consecutive Days through no act or fault of the Contractor, and upon seven (7) Days written notice to the Owner, the Contractor may terminate the Agreement if the Owner:
1. Has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work;
 2. Fails to pay the Contractor in accordance with the Agreement; or
 3. Otherwise materially breaches the Agreement
- C. Upon termination by the Contractor in accordance with this Section, the Contractor is entitled to recover from the Owner payment for all Work executed and for any proven loss, cost, or expense in connection with the Work, including all demobilization.

9.06 Obligations Arising Before Termination

- A. Even after termination, the provisions of this Agreement still apply to any Work performed, payments made, events occurring, costs charged or incurred, or obligations arising before the termination date.

ARTICLE 10 – DISPUTE MITIGATION AND RESOLUTION

10.01 Work Continuance and Payment

- A. Unless otherwise agreed in writing, the Contractor shall continue the Work and maintain the Construction Schedule during any dispute mitigation or resolution proceedings. If the Contractor continues to perform, the Owner shall continue to make payments in accordance with the Agreement.

10.02 Direct Discussions

- A. If the Parties cannot reach resolution on a matter relating to or arising out of the Agreement, the Parties shall endeavor to reach resolution through good faith direct discussions between the Parties' representatives, who shall possess the necessary authority to resolve such matters and who shall record the date of first discussions. If the Parties' representatives are not able to resolve such matter within five (5) Business Days from the date of first discussion, the Parties' representatives shall immediately inform senior executives of each of the parties in writing that a resolution could not be reached. Upon receipt of such notice, the senior executives of the Parties shall meet within five (5) Business Days to endeavor to reach resolution. If the dispute remains unresolved after fifteen (15) Days from the date of first discussion, the Parties shall submit such matter to the dispute mitigation and dispute resolution procedures selected below.

10.03 Mediation

- A. If direct discussions pursuant to Section 10.02 do not result in resolution of the matter, the Parties shall endeavor to resolve the matter by mediation through the current Construction Industry Mediation Rules of the American Arbitration Association, or the Parties may mutually agree to select another set of mediation rules. The parties shall mutually agree upon the mediator and the mediation process. The mediation shall be convened within thirty (30) Business Days of the matter first being discussed and shall conclude within forty-five (45) Business Days of the matter first being discussed. Either party may terminate the mediation at any time after the first session by written notice to the non-terminating Party and mediator. The costs of the mediation shall be shared equally by the Parties.

10.04 Binding Dispute Resolution

- A. If the matter is unresolved after submission of the matter to mediation, the Parties shall submit the matter to litigation in either the state or federal court having jurisdiction of the matter in the location of the Project.

10.05 Costs

- A. The Parties shall pay their own costs and attorneys' fees of any binding dispute resolution procedures unless otherwise determined by the adjudicator.

10.06 Multiparty Proceeding

- A. All parties necessary to resolve a matter agree to be parties to the same dispute resolution proceeding, if possible. Appropriate provisions shall be included in all other contracts relating to the Work to provide for the joinder or consolidation of such dispute resolution procedures.

10.07 Lien Rights

- A. Nothing in this article shall limit any rights or remedies not expressly waived by the Contractor that Contractor may have under lien laws.

ARTICLE 11 – MISCELLANEOUS

11.01 Conflicting Terms

- A. These General Conditions are supplementary to the General Provisions of the New Hampshire Form P-37 Agreement, and in no case shall be construed or interpreted to reduce or supersede the requirements thereof. In all cases these General Conditions shall be considered as additions to those described in the Agreement.

ARTICLE 12 – CONTRACT DOCUMENTS

12.01 Interpretation of Contract Documents

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- A. The Contract Documents are complimentary. If Work is shown only on one of the Contract Documents but not on the other, the Contractor shall perform the Work as though fully described on both.
- B. In case of conflict between the drawings and specifications, the specifications shall govern. In any case of omissions or errors in figures, drawings, or specifications, the Contractor shall submit the matter to the Owner for clarification. The Owners clarifications are final and binding.
- C. The Drawings are generally made to scale, but all working dimensions shall be taken from the figured dimensions, or by actual measurements taken at the Site, and in no case by scaling. Whether or not an error is believed to exist, deviation from the drawings and dimensions given thereon shall be made only after approval in writing from the Owner and its Design Professional.
- D. Unless otherwise specifically defined in the Agreement, any terms that have well-known technical or trade meanings shall be interpreted in accordance with their well-known meanings.

12.02 Order of Precedence

- A. In case of any inconsistency, conflict, or ambiguity among the Contract Documents, the documents shall govern in the following order:
 - 1. Change Orders and written amendments to the Agreement;
 - 2. The Agreement;
 - 3. The drawings (large scale governing over small scale), specifications, and addenda issued and acknowledged before the execution of the Agreement;
 - 4. Approved submittals;
 - 5. Information furnished by the Owner;
 - 6. Other Contract Documents listed in the Agreement.
- B. Among categories of documents having the same order of precedence, the term or provision that is strictest shall control.

END OF GENERAL CONDITIONS

SECTION 00 73 00

SUPPLEMENTARY CONDITIONS FOR FEDERALLY FUNDED PROJECTS

PART 1 – GENERAL

1.01 NOTICE OF FEDERAL FUNDING

- A. This Project is being performed in whole or in part using federal funds. Therefore, all work or services performed by the Contractor and its subcontractors shall be subject to the terms and conditions set forth in this Section in addition to all terms and conditions in the Agreement, General Conditions, and other contract documents. The concepts, rules and guidelines set forth in 2 CFR 200 describing allowable costs and administrative requirements apply.

1.02 DEFINITIONS

- A. As used herein, “Federal Government” means the government of the United States of America. “Federal Agency” means an agency, entity, department, or division of the Federal Government that is providing funding for this Project. All other terms shall have the meanings established in the Agreement, General Conditions, and Project Manual, unless such definitions conflict with a definition provided in an applicable statute or regulation.

1.03 CONFLICTING TERMS OR CONDITIONS

- A. To the extent that any terms or conditions set forth herein conflict with the Agreement or its General Conditions, the more stringent of the two terms shall govern.

1.04 NO OBLIGATION BY FEDERAL GOVERNMENT

- A. The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, Contractor, or any other party pertaining to any matter resulting from the contract.

1.05 COMPLIANCE WITH FEDERAL LAWS, REGULATIONS AND EXECUTIVE ORDERS

- A. The Contractor and its subcontractors and suppliers shall comply with all applicable Federal laws, regulations, and executive orders, regardless of whether set forth herein. The Contractor shall assist and enable the State in complying with any requirements imposed by the Federal Agency as a condition of funding.

1.06 NONDISCRIMINATION

- A. Per Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq.), Contractors are prohibited from discrimination on the basis of race, color, and national origin in programs and activities receiving federal financial assistance.
- B. Contractors shall not discriminate against individual with disabilities and shall provide goods and services in a manner that is accessible to and usable by individuals with disabilities, in compliance with Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794), and its

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implementing regulations, and Title II of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. §§ 12101 et seq.)

1.07 EQUAL EMPLOYMENT OPPORTUNITY

A. Equal Opportunity in Construction Projects: Pursuant to 41 CFR Part 60, during the performance of this contract, the Contractor agrees as follows:

1. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:
 - a. Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
3. The Contractor will not discharge or in any other manner discriminate against an employee or applicant for employment because such employee or applicant has inquired about, or discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Contractor's legal duty to furnish information.
4. The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract of understanding, a notice to be provided advising the said labor union or workers representatives of the Contractor's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
5. The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
6. The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
7. In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible

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for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

8. The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance:
 - a. Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

1.08 MINORITY BUSINESSES

- A. The Contractor must take all necessary affirmative steps to ensure that minority businesses, women's business enterprises, and labor surplus area firms are used when possible.
- B. Affirmative steps must include:
 1. Placing qualified small and minority businesses and women's business enterprises on solicitation lists;
 2. Ensuring that small and minority businesses and women's business enterprises are solicited whenever there are potential sources;
 3. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;
 4. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority business and women's business enterprises;
 5. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce; and
 6. Requiring subcontractors to take the affirmative steps listed above.

1.09 PROHIBITION ON SEGREGATED FACILITIES

- A. By submission of this Bid, the Contractor certifies that it does not and will not maintain or provide for its employees and segregated facilities at any of its establishments, and it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agree that a breach of this certification is a violation of the Equal Employment opportunity clause of this Agreement. The Contractor further certifies that no employee will be denied access to adequate facilities on the basis of sex or disability.
- B. "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage

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or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

1.10 COPELAND ANTI-KICKBACK ACT

- A. The Contractor shall comply with all applicable provisions of the Copeland Anti-Kickback Act (40 U.S.C. 3145), as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"), which are incorporated into this Agreement by reference. This act provides that each contractor or subcontractor is prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which they are otherwise entitled. The Contractor shall report all suspected or reported violations to the State and the U.S. Department of Treasury.

1.11 CONTRACT WORK HOURS AND SAFETY STANDARD ACT

- A. The Contractor shall comply with all applicable provisions of 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5). Under 40 U.S.C. 3702 of the Act, the Contractor is required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than one and a half times the basic rate of pay for all hours worked in excess of 40 hours in the work week. The requirements of 40 U.S.C. 3704 are applicable to construction work and provide that no laborer or mechanic must be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous. These requirements do not apply to the purchase of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

1.12 SUSPENSION AND DEBARMENT

- A. Universal Identifier and System for Award Management (SAM): The Contractor shall maintain active registration in the System for Award Management (SAM) throughout the term of this contract and provide evidence of active registration and assignment of a Universal Entity Identified (UEI) to the State as requested.
- B. By signing the Agreement the Contractor attests that in accordance with 2 CFR 180.220, to the best of the Contractors knowledge, the Contractor is not debarred, suspended, excluded, disqualified, or otherwise ineligible from participation in covered transactions as defined in 2 CFR 180. Should the Contractor become debarred, suspended, excluded, disqualified, or otherwise ineligible at any point during the contract term, the Contractor shall immediately notify the State.

1.13 LOBBYING RESTRICTIONS

- A. The Contractor certifies by signing the Agreement, to the best of his or her knowledge and belief, that:

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1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the Contractor, to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 USC 1253.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection this Federal contract, grant, loan, or cooperative agreement, the Contractor shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," OMB Number 4040-0013, in accordance with its instructions.
3. The Contractor shall require that the language of this certification is included in all subcontracts, sub-subcontracts, and material supply agreements, at all tiers, and that all such sub agreements shall certify and disclose accordingly.

1.14 PROCUREMENT OF RECOVERED MATERIALS

- A. The Contractor shall comply with the requirements of Section 6002 of the Solid Waste Disposal Act, as prescribed in 2 CFR 200.323, including procuring only items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition, where the purchase price of the item exceeds \$10,000 or the value of the quantity acquired during the preceding fiscal year exceeds \$10,000; procuring solid waste management services in a manner that maximizes energy and resource recovery; and establishing an affirmative procurement program for procurement of recovered materials identified in the EPA guidelines.

1.15 ACCESS TO RECORDS AND REPORTS

- A. The Contractor shall maintain an acceptable cost accounting system. The Contractor agrees to provide the State, the Federal Agency, and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers, and records of the Contractor which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts, and transcriptions. The Contractor shall maintain all books, records, and reports required under this contract for a period of not less than five years after final payment is made and all pending matters are closed.

1.16 SAFETY AND ACCIDENT PREVENTION

- A. All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR part 1910 with the same force and effect as if given in full text. The employer must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The employer retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR part 1910). The employer must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

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- B. Seat Belt Use: The Contractor is encouraged to adopt and enforce on-the-job seat belt policies and programs for their employees when operating company-owned, rented, or personally owned vehicles.
- C. Text Messaging: The Contractor is encouraged to adopt and enforce policies that ban text messaging while driving and to establish workplace policies to decrease accidents caused by distracted drivers.

1.17 RIGHTS TO INVENTIONS

- A. Contracts or Agreements that include the performance of experimental, developmental, or research work must provide for the rights of the Federal Government and the State in any resulting inventions as established by 37 CFR part 401, Rights to Inventions Made by Non-profit Organizations and Small Business Firms under Government Grants, Contracts, and Cooperative Agreements. This Agreement incorporates by reference the patent and inventions rights as specified within 37 CFR 401.14, Contractor must include this requirement in all sub-tier contracts involving experimental, developmental, or research work.

1.18 ENERGY CONSERVATION

- A. The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201 et seq.).

1.19 CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

- A. If the amount of the Contract exceeds \$100,000, the Contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387), and to take any necessary actions to ensure compliance. The Contractor shall promptly notify the State and Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA) of any violations of these standards, orders, or regulations.
- B. Environmental Laws and Regulations: The Contractor must comply with all generally applicable environmental laws and regulations unless explicitly exempted under the U.S. Department of Treasury's SLFRF Final Rule, supplemental guidance, or the terms and conditions of the Agreement or the prime agreement between Treasury and the State.
 - 1. The Contractor will include this clause in all subcontracts and will ensure subcontractor compliance with these terms.

1.20 PROTECTIONS FOR WHISTLEBLOWERS

- A. In accordance with 41 USC 4712, an employee of a contractor, subcontractor, grantee, or subgrantee, or personal services contractor may not be discharged, demoted, or otherwise discriminated against as reprisal for disclosing to a person or entity listed below information that the employee reasonably believes is evidence of gross mismanagement of a federal contract or grant, a gross waste of federal funds, an abuse of authority relating to a federal contract or grant, a substantial or specific danger to public health or safety, or a violation of law, rule, or other

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regulation related to a federal contract (including the competition or negotiation of a contract) or grant.

B. The list of persons and entities referenced in the paragraph above includes the following:

1. A member of Congress or a representative of a committee of Congress;
2. An Inspector General;
3. The Government Accountability Office;
4. A Treasury employee responsible for contract or grant oversight or management;
5. An authorized official of the US Department of Justice or other law enforcement agency;
6. A court or grand jury; or
7. A management official or employee of the State, subrecipient, contractor, or subcontractor, who has the responsibility to investigate, discover, or address misconduct.

C. The Contractor and all subcontractors shall inform their employees in writing of the rights and remedies provided in 41 USC 4712 in the predominant language of the workforce.

1.21 DRUG FREE WORKPLACE ACT

A. The Contractors shall provide a drug free workplace in accordance with the Drug Free Workplace Act of 1988, 41 U.S.C. Chapter 81, and all applicable regulations. The Contractor shall report any conviction of the Contractor's personnel under a criminal drug statute for violations occurring on the Contractor's premises or off the Contractor's premises while conducting official business. A report of a conviction shall be made to the State within five (5) business days after the conviction.

1.22 ACCESS REQUIREMENTS FOR PERSONS WITH DISABILITIES

A. The Contractor shall comply with 49 U.S.C. 5301 (d), stating Federal policy that the elderly and persons with disabilities have the same rights as other persons to use mass transportation services and facilities and that special efforts shall be made in planning and designing those services and facilities to implement that policy. The Contractor shall also comply with all applicable requirements of Sec. 504 of the Rehabilitation Act of 1973, as amended, 29 U.S.C. 794, which prohibits discrimination on the basis of handicaps, and the Americans with Disabilities Act of 1990, as amended, 42 U.S.C. et seq., which requires that accessible facilities and services be made available to persons with disabilities, including and subsequent amendments thereto.

1.23 DOMESTIC PREFERENCES FOR PROCUREMENT

A. The Contractor shall, to the greatest extent practicable and as applicable, provide a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including but not limited to iron, aluminum, steel, cement, and other manufactured products) as prescribed by 2 CFR 200.322. For the purposes of this requirement, "produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States, and "manufactured products" means items and construction materials composed in whole or in part of non-ferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

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- B. Infrastructure projects must implement the Buy America preferences set forth in 2 CFR part 184, and the requirements of Specification Section 00 73 13 "Build America Buy America Requirements."

1.24 PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE EQUIPMENT

- A. The Contractor shall adhere to the requirements of 2 CFR 200.216 regarding certain telecommunications and video surveillance equipment. The Contractor is prohibited from procuring, obtaining, or extending, renewing, or entering into a contract that involves equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as critical technology as part of any system. As described in Public Law 115-232, section 889, covered telecommunications equipment is telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).

END OF SUPPLEMENTARY CONDITIONS FOR FEDERALLY FUNDED PROJECTS

SECTION 00 73 13

BUILD AMERICA, BUY AMERICA REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. The Project is funded in whole or in part by a Federal Financial Assistance Program that is required to comply with the Build America, Buy America Act ("the Act"). Pub. L. No. 117-58, §§ 70901-52, which was signed into law as part of the Infrastructure Investment and Jobs Act ("IIJA"). Pub. L. No. 117-58.
- B. All iron and steel, manufactured products, and construction materials incorporated into the Project shall be produced in the United States. This requirement applies to the entire Project.
- C. The Contractor and all Sub-contractors, Sub-subcontractors, Suppliers, and other entities retained by the Contractor are required to comply with, in addition to all other requirements of the Contract Documents, the requirements of the Act.

1.02 DEFINITIONS

- A. Buy America Preference: Means all Iron and Steel, Manufactured Products, and Construction Materials incorporated into the Project are produced in the United States.
- B. Component: Means an article, material, or supply, whether manufactured or unmanufactured, incorporated directly into a manufactured product; or, where applicable, an iron or steel product.
- C. Construction Materials: Means articles, materials, or supplies that consist of only one of the items listed in paragraph (1) of this definition, except as provided in paragraph (2) of this definition. To the extent one of the items listed in paragraph (1) contains as inputs other items listed in paragraph (1), it is nonetheless a construction material.
 - 1. The listed items are:
 - a. Non-ferrous metals;
 - b. Plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cable);
 - c. Glass (including optic glass);
 - d. Fiber optic cable (including drop cable);
 - e. Optical fiber;
 - f. Lumber;
 - g. Engineered wood; and
 - h. Drywall
 - 2. Minor additions of articles, materials, supplies, or binding agents to a construction material do not change the categorization of the construction material.

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- D. Iron or Steel Products: Means articles, materials, or supplies that consist wholly or predominantly of iron or steel or a combination of both.
1. Predominantly of iron or steel or a combination of both means that the cost of the iron and steel content exceeds 50 percent of the total cost of all its components. The cost of iron and steel is the cost of the iron or steel mill products (such as bar, billet, slab, wire, plate, or sheet), castings, or forgings utilized in the manufacture of the product and a good faith estimate of the cost of iron and steel components.
- E. Manufactured Products: Means:
1. Articles, materials, or supplies that have been:
 - a. Processed into a specific form and shape; or
 - b. Combined with other articles, materials, or supplies to create a product with different properties than the individual articles, materials, or supplies.
 2. If an item is classified as an iron or steel product, a construction material, or a section 70917(c) material under the definitions set forth in this section, then it is not a manufactured product. However, an article, material, or supply classified as a manufactured product under paragraph (1) of this definition may include components that are construction materials, iron or steel products, or section 70917(c) materials.
- F. Produced in the United States: Means:
1. In the case of iron or steel products, all manufacturing processes from the initial melting stage through the application of coatings, occurred in the United States.
 2. In the case of manufactured products:
 - a. The product was manufactured in the United States; and
 - b. The cost of the components of the manufactured products that are mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard that meets or exceeds this standard has been established under applicable law or regulation for determining the minimum amount of domestic content of the manufactured product.
 3. In the case of construction materials, all manufacturing processes for the construction material occurred in the United States. See Section 1.05 for standards for “all manufacturing processes.”
- G. Section 70917(c) Materials: Means cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives. Section 70917(c) materials are excluded from being classified as “construction materials” or as inputs of “construction materials.” As such, Section 70917(c) materials do not have a “Buy America Preference” unless they are used as a component of “manufactured product,” or “iron or steel product.”

1.03 APPLICATION OF A BUY AMERICA PREFERENCE

- A. All articles, materials, supplies, and other components of construction incorporated into the Project shall be classified into one of the following categories:

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1. Iron or steel products;
 2. Manufactured Products;
 3. Construction Materials; or
 4. Section 70917(c) materials.
- B. An article, material, or supply should not be considered to fall into multiple categories. The classification of an article, material, or supply as falling into one of the categories listed must be made based on its status at the time it is brought to the work site for incorporation into the Project. Articles, materials, or supplies incorporated into the Project must meet the Buy America Preference for only the single category in which it is classified.
- C. The Act only applies to articles, materials, and supplies that are consumed in, incorporated into, or affixed to the Project. It does not apply to tools, equipment, and supplies, such as temporary scaffolding, brought to the construction site and removed at or before the completion of the Project. Nor does it apply to equipment and furnishing, such as movable chairs, desks, and portable computer equipment, that are used at or within the finished Project, but are not an integral part of or permanently affixed to the structure.

1.04 CONSTRUCTION MATERIAL STANDARDS

- A. The following standards shall be used to determine if a construction material is considered "produced in the United States". Except as specifically provided, only a single standard of this section should be applied to a single construction material:
1. Non-ferrous Metals: All manufacturing processes, from initial smelting or melting through final shaping, coating, and assembly, occurred in the United States.
 2. Plastic and Polymer-Based Products: All manufacturing processes, from initial combination of constituent plastic or polymer-based inputs, or, where applicable, constituent composite materials, until the item is in its final form, occurred in the United States.
 3. Glass: All manufacturing processes, from initial batching and melting of raw materials through annealing, cooling, and cutting, occurred in the United States.
 4. Fiber Optic Cable (including drop cable): All manufacturing processes, from the initial ribboning (if applicable) through buffering, fiber stranding and jacketing, occurred in the United States. All manufacturing processes also include the standards for glass and optical fiber, but not for non-ferrous metals, plastic and polymer-based products, or any others.
 5. Optical Fiber: All manufacturing processes, from the initial preform fabrication stage through the completion of the draw, occurred in the United States.
 6. Lumber: All manufacturing processes, from initial debarking through treatment and planning, occurred in the United States.
 7. Drywall: All manufacturing processes, from initial blending of mined or synthetic gypsum plaster and additives through cutting and drying of sandwiched panels, occurred in the United States.
 8. Engineered Wood: All manufacturing processes from the initial combination of constituent materials until the wood product is in its final form, occurred in the United States.

1.05 SUBMITTAL REQUIREMENTS

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- A. The Contractor shall be responsible for ensuring, and providing supporting certifications, that all items incorporated into the Work, including those required to be submitted by individual Specification sections, scheduled or indicated on Drawings, and incidental items incorporated into the Work, comply with the Build America, Buy America Act. Such certification may be made either by manufacturers' standard compliance certification or made by the manufacturer on the Product/Material Compliance Form provided at the end of this Section.
- B. At project Close-Out the Contractor shall fill out and submit to the Owner the form below titled "Build America, Buy America Certificate of Compliance", certifying that all articles, materials, supplies, and other components of construction incorporated into the Project meet the requirements of the Build America, Buy America Act.

END OF BUILD AMERICA, BUY AMERICA REQUIREMENTS

PRODUCT/MATERIAL COMPLIANCE FORM

Manufacturer Information

Company Name:

Street Address:

City, State, Zip Code:

Instructions: List all items provided by the indicated manufacturer that are being submitted and incorporated into the Work. Classify each item into <u>one</u> of the indicated categories. Section 70917(c) materials do not need to be individually listed.	Product/Material Category		
	Iron and Steel	Manufactured Product	Construction Material
Description			

I/We certify that all products/materials indicated above meet the requirements of the Build America, Buy America Act (“the Act”). Pub. L. No. 117-58, §§ 70901-52, which was signed into law as part of the Infrastructure Investment and Jobs Act (“IIJA”). Pub. L. No. 117-58. All items listed were produced or manufactured in the United States.

Manufacturers Authorized Representative

Name:

Title:

Signature:

Date:

BUILD AMERICA, BUY AMERICA CERTIFICATE OF COMPLIANCE

Project Name:

Project Number:

Contract Date:

Owner: **State of New Hampshire, Department of Natural and Cultural Resources**

Contractor Name:

Street Address:

City, State, Zip Code:

The undersigned certifies that it has met all requirements of the Build America, Buy America Act ("the Act"). Pub. L. No. 117-58, §§ 70901-52, which was signed into law as part of the Infrastructure Investment and Jobs Act ("IIJA"). Pub. L. No. 117-58.

I/We further certify the following Buy America Preferences have been used on the Project:

1. All iron and steel used in the project were produced in the United States. This means all manufacturing processes, from initial melting stage through the application of coatings, occurred in the United States.
 2. All manufactured products used in the project were produced in the United States. This means the manufactured product was manufactured in the United States, and the cost of the components of the manufactured product that were mined, produced, or manufactured in the United States is greater than 55 percent of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been established under applicable law or regulation.
 3. All construction materials were manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States.
-

I/We further certify that to the best of our knowledge this Certification is true and accurate, and that a false certification may be considered a criminal act in violation of 18 USC 1001.

NAME OF CONTRACTORS AUTHORIZED REPRESENTATIVE (print):

TITLE:

SIGNATURE OF AUTHORIZED REPRESENTATIVE:

DATE:

CONTRACTOR'S APPLICATION for PAYMENT

Application No. #

Application Period: xx/xx/xxxx

Application Date: xx/xx/xxxx

Project Name:

Date of Commencement: xx/xx/xxxx

Owners Project #:

TO: State of New Hampshire
Department of Natural and Cultural Resources

FROM: (Contractor Name)
(Contractor Address)

1. CONTRACT PRICE

(Bid Sub Total plus any Alternates)

2. ALLOWANCE**3. PRICE LIMITATION**

\$0.00

4. TOTAL COMPLETED & STORED TO DATE

\$0.00

(Column G on Schedule of Values)

5. RETAINAGE10% of Completed Work

\$0.00

(Columns D+E+F on Schedule of Values)

6. TOTAL EARNED LESS RETAINAGE

\$0.00

(Line 4 minus line 5)

7. LESS PRIOR APPLICATIONS for PAYMENT

\$0.00

(Line 6 from prior application)

8. AMOUNT DUE THIS APPLICATION

\$0.00

9. BALANCE TO FINISH, PLUS RETAINAGE

\$0.00

(Line 3 minus line 6, less unspent Allowance)

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that to the best of their knowledge, belief and information: (1) the Work covered by this Application for Payment has been completed in accordance with the Contract Documents; (2) that all amounts have been paid by the Contractor for Work which previous Applications for Payment were issued and payments received from the Owner, and clear of all Liens, security interests and encumbrances; and (3) that the current payment shown herein is now due.

BY: (Contractors Signature)

Date: xx/xx/xxxx

CHANGE ORDER SUMMARY

Total Available Allowance		\$0.00
Number	Description	Amount
Allowance Balance:		\$0.00

PAYMENT AUTHORIZATION

(For Department of Natural and Cultural Resources use only)

Vendor Code #

P.O. Number

Line #	Accounting Unit	Amount

Activity Code

(as required)

APPROVED BY:

(Print name)

(Title)

Signature

Date:

SCHEDULE OF VALUES	Application No. #	Application Period: xx/xx/xxxx	Application Date: xx/xx/xxxx
Project Name:	Date of Commencement: xx/xx/xxx		Owners Project #:

Application Period: xx/xx/xxxx

Application Date: xx/xx/xxxx

Date of Commencement: xx/xx/xxx

Owners Project #:

Note: Use the Schedule of Values provided with the bid, and any Allowances or Alternates

[illegible]

Office Use Only
(DSFM 106 rev 6/2019)

Date Rcv: _____

Rcv By: _____

Amount: _____

CK #: _____

Rev: _____

Permit #: _____

STATE OF NEW HAMPSHIRE DEPARTMENT OF SAFETY

Robert L. Quinn

Division of Fire Safety

Office of the State Fire Marshal

Paul J. Parisi, State Fire Marshal

Mailing Address: 33 Hazen Drive Concord NH 03305

603-223-4289, Fax 603-223-4294

TDD Access: Relay NH 1-800-735-2964 Arson Hotline 1-800-400-3526



STATE BUILDING PERMIT APPLICATION

Submit a separate application per permit

APPLICATION

Applicant Information (Property Owner)

Property Information

Name: _____

Building Name: _____

Title: _____

Map/Lot#: _____

Address: _____

Address: _____

City: _____ State : _____ Zip: _____

City: _____ State: _____ Zip: _____

Email: _____

Telephone #: _____

APPLICATION INFORMATION

Permit Type (Check One):

- ☐ Building Construction ☐ Mechanical (Fuel Gas/Equipment)
☐ Fire Protection ☐ Mechanical (Non-Fuel gas portion of work)
☐ Electrical ☐ Plumbing

Construction Type:

- ☐ New Construction
☐ Addition
☐ Renovation

IBC Use Group: _____ Building Area: _____ SF

CONTRACTOR INFORMATION

General Contractor Name: _____ Email: _____

Company Name: _____ Telephone #: _____

Address: _____

City: _____ State: _____ Zip: _____

LICENSING INFORMATION

Please provide a copy of applicable license for electrical, plumbing or mechanical applications

- ☐ Electrical ☐ Fire Protection ☐ Mechanical (Fuel Gas) ☐ Plumbing

NH License #: _____ Exp. Date: _____ Email: _____

Name: _____ Telephone #: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

RESPONSIBLE DESIGN PROFESSIONAL (IF APPLICABLE)

Name: _____ NH License # & Exp. Date: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Brief Description:

Owner's Signature _____ Date: _____

I hereby certify, subject to the penalties of unsworn falsification pursuant to RSA 641:3, that all statements made on this application are true to the best of my knowledge and that I am responsible to ensure that all construction work will be completed in accordance with all Federal, State and local laws and ordinances, including local Zoning Ordinances as applicable and the State of NH Building Code, and that I further authorize employees and or agents of the NH Fire Marshal's Office to enter this property for purposes of inspections.

PERMIT FEES PURSUANT TO NH CODE OF ADMINISTRATIVE RULES Saf-C 8105

***Please make checks payable to "Treasurer, State of New Hampshire"**

Calculations: (Electrical/Mechanical/Plumbing)

Total cost of construction for permit calculation :\$_____ (electrical/mechanical/plumbing only)

JOB COST	AMOUNT	MULTIPLY	INSP. FEE (MIN \$75.00)
1st 100,000 0.01-100,000		1.2%	
Cost 100,000.01-300,000	+	0.5%	+
Costs 300,000.01 +	+	0.3%	+
Total:	=	Total Fee:	=

Re-Inspection Fee (Electrical/Mechanical /Plumbing)

10% Re-inspection Fee: 10% of the fee calculated, provided that the fee shall not be less than \$100.00 nor more than \$500.00.

New Commercial Permit Fee (Building)

FEE TYPE	SQUARE FOOTAGE	FEE AMOUNT	TOTAL INSP. FEE
BUILDING PERMIT		0.30	
OTHER STRUCTURES min. \$35.00		1.00	

New Commercial Renovation Permit Fee (Building)

FEE TYPE	SQUARE FOOTAGE	FEE AMOUNT	TOTAL INSP. FEE
BUILDING PERMIT		0.15	
OTHER STRUCTURES min. \$35.00		\$1.00	

New Commercial Permit & Renovation Permit Fee (Fire Protection)

FEE TYPE	# OF DEVICES	FEE AMOUNT EACH	TOTAL INSP. FEE MIN \$35.00
FIRE PROTECTION		1.00	

Re-Inspection fee for Building, Fire Protection and Other; Permit fee is \$100.00 per inspection

SECTION 01 10 00

SUMMARY

PART 1 – GENERAL

1.01 DESCRIPTION

A. Section includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work sequence.
4. Access to site.
5. Coordination with occupants.
6. Work restrictions.
7. Specification and drawing conventions.
8. Miscellaneous provisions.

B. Related Work Specified Elsewhere:

1. SECTION 01 50 00: Temporary Facilities and Controls

1.02 PROJECT INFORMATION

A. Project Identification: White Lake Area 1 Toilet Building Renovations, CAP 2131

1. Project Location: 94 State Park Road, Tamworth, NH 03886

B. Owner: State of New Hampshire, Department of Natural and Cultural Resources

1. Owner's Representative: Scott Coruth, Architect. Phone: 603-271-3676. E-mail: scott.d.coruth@dnrc.nh.gov

1.03 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Construction of a new shower room addition.
2. Selective demolition and renovations to the existing toilet rooms.
3. Addition of a new pot washing station.
4. Building excavation and sitework.
5. Construction of a new septic system.

B. Type of Contract: Project will be constructed under a stipulated lump sum grand total contract with the State of New Hampshire in accordance with the General Conditions of the Contract for Construction.

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- C. The Contractor shall, except as otherwise specifically stated in Contract Documents, provide and pay for all materials, labor, tools, equipment, water, heat, fuel, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities or every nature whatsoever necessary to execute, complete, and deliver the work within the specified time.

1.04 WORK SEQUENCE

- A. Work shall commence within 15 days after issuance of Notice to Proceed. Failure to comply shall constitute a Default of Contract.

1.05 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Limits: Limit site disturbance, including earthwork and clearing of vegetation to 40-feet beyond building perimeter; 10-feet beyond surface walkways, patios, surface parking, and utilities less than 12-inches in diameter; 15-feet beyond primary roadway curbs and main utility branch trenches; and 25-feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas in order to limit compaction in the constructed area.
 - 2. Driveways, Walkways and Entrances: Keep driveways, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.06 COORDINATION WITH OCCUPANTS

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

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2. Notify Owner not less than 72-hours in advance of activities that will affect Owner's operations.

1.07 WORK RESTRICTIONS

- A. Work restrictions, General: Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 4:30 p.m., Monday through Friday, unless otherwise indicated.
1. Access for work outside of normal working hours shall be requested in writing to the Contract Administrator, at least one week in advance. The Contract Administrator may accept or reject the request.
 2. No access during the following observed holidays:
 - a. New Years' Day.
 - b. Martin Luther King Jr. Civil Rights Day.
 - c. Washington's Birthday.
 - d. Memorial Day.
 - e. Independence Day.
 - f. Labor Day.
 - g. Veterans' Day.
 - h. Thanksgiving Day.
 - i. Day after Thanksgiving.
 - j. Christmas Day.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
1. Notify Owner not less than two days in advance of proposed utility interruptions.
 2. Obtain Owners written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruptions to owner occupancy with owner.
1. Notify Owner not less than two days in advance of proposed disruptive operations.
 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

1.08 SPECIFICATION AND DRAWING CONVENTIONS

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

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SUMMARY

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Section Includes:
1. Schedule of Values
 2. Applications for Payment
 3. Allowances
 4. Alternates

1.02 SCHEDULE OF VALUES

- A. Submit printed schedule on Schedule of Values form provided by Owner. Contractor's standard form or electronic media printout will be considered.
- B. Submit Schedule of Values in duplicate within 15 days after the date of issuance of Notice to Proceed. Failure to submit within specified time period will constitute Default of Contract.
- A. Utilize the Schedule of Values provided with the bid and any addenda. The Contractor may add line items to the Schedule of Values with approval from the contract administrator. No line items may be deleted. Identify each line item with number and title of specification Section. Identify General Conditions and Requirements, bonds, and insurance.
- C. Include separate line item for the amount of each Allowance Specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for each item.
- D. Revise schedule to list approved Change Orders, with each Application for Payment.

1.03 APPLICATION FOR PAYMENT

- A. Submit three copies of each application or electronic transmittal along with any supporting materials.
- B. Execute on Application for Payment form provided by Owner.
- C. Items on the Application for Payment shall be consistent with the items listed on the Proposal Form. Utilize Schedule of Values for listing items in Application for Payment.
- D. Submit updated construction schedule with each Application for Payment.
- E. Payment Period: Submit monthly, or as otherwise allowed by the Owner.

1.04 ALLOWANCES

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- A. Contingency Allowances: Use the allowance only as directed by Section 00 41 00 "Bid Proposal Form".
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF PRICE AND PAYMENT PROCEDURES

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Work Specified Elsewhere:
 - 1. SECTION 01 20 00: Price and Payment Procedures
 - 2. SECTION 01 60 00: Product Requirements

1.02 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitution for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitution for Convenience: Changes proposed by Contractor that are not required in order to meet other Project requirements but may offer advantage to Contractor.

1.03 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or installation cannot be provided.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c. Detailed comparisons of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.

- g. List of similar installation for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
 - j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure or proposed substitution to produce indicated results.
 - n. Build America, Buy America: Submit certification from manufacturer, indicating that substitution meets the requirements of the Build America, Buy America Act. No substitution will be considered without this certification.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.04 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.05 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 – PRODUCTS

2.01 SUBSTITUTIONS

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- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
- a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Requested substitution provides sustainable design characteristics that specified product provided.
 - c. Substitution request is fully documented and properly submitted.
 - d. Requested substitution will not adversely affect Contractor's construction schedule.
 - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - f. Requested substitution is compatible with other portions of the Work.
 - g. Requested substitution has been coordinated with other portions of the Work.
 - h. Requested substitution provides specified warranty.
 - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed.

PART 3 – EXECUTION (Not Used)

END OF SUBSTITUTION PROCEDURES

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Work Specified Elsewhere:
 - 1. SECTION 01 20 00: Price and Payment Procedures
 - 2. SECTION 01 25 00: Substitution Procedures
 - 3. SECTION 01 30 00: Administrative Requirements

1.02 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in Work, not involving adjustment to the Contract Sum or the Contract Time.

1.03 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specification.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified by Proposal Request or 14 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include and updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for change to Architect.

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1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicated effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available float before requesting an extension of the Contract Time.
6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.04 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Contract Change Order for signatures of Owner and Contractor on Owner's standard form.

1.05 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on Architects standard form. Construction Change Directive instructs Contractor to proceed with a change in Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and materials basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF CONTRACT MODIFICATION PROCEDURES

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Section includes administrative provisions for coordinating construction operations, submittal procedures, delegated design, and Contractor's construction schedule including, but not limited to, the following:
 - 1. Project management and coordination
 - 2. Submittal procedures
 - 3. Construction schedule
- B. Related Work Specified Elsewhere:
 - 1. SECTION 01 70 00: Execution and Closeout Requirements

1.02 PROJECT MANAGEMENT AND COORDINATION

- A. Subcontract List: Submit a written summary identifying individuals or firms proposed for each portion of the Work.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance AT Project site. List e-mail addresses and telephone numbers.
- C. Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work.
- D. Requests for Information (RFIs): On discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI. Use forms acceptable to Architect.
- E. Schedule and conduct progress meetings at Project site at biweekly intervals. Notify Owner of meeting dates and times. Require attendance of each subcontractor or other entity concerned with current progress or involved in planning, coordination, or performance of future activities.
 - 1. Contractor will record minutes and distribute to all attendees, including Owner/Architect.

1.03 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Requests for Electronic digital data files of the Contract Drawings will be considered on a case-by-case basis and documents may be provided by Architect for Contractor's use in preparing submittals. Contractor is to submit request for specific drawing file pertinent to shop drawing preparation.

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1. Architect may furnish Contractor specific digital data drawing files of the Contract Drawings for use in preparing Shop Drawings.
 - a. The decision to provide digital file data is at the sole discretion of the architect. No damages or claims will be accepted for failure to provide requested digital data.
 - b. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
 - c. Contractor shall execute a liability release and/or data licensing agreement in the form acceptable to the Architect.
- B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 1. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 2. Architect will discard submittals received from sources other than Contractor.
- C. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with unique identifier, including project identifier, Specification Section number, and revision identifier.
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
- D. Identify options requiring selection by Architect.
- E. Identify deviations from the Contract Documents on submittals.
- F. Contractor's Construction Schedule Submittal Procedure:
 1. Submit required submittals in the following format:
 - a. Working electronic copy of schedule file, where indicated.
 - b. PDF electronic file
 2. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 3. Coordinate Contractor's construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

PART 2 – PRODUCTS

2.01 SUBMITTAL PROCEDURES

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- A. General Submittal Procedure Requirements: Prepare and provide submittals for all products used on the Project, and as required and indicated by individual Specification Sections and Drawings.
 - 1. Submit electronic submittals via email as PDF electronic files.
- B. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2.02 ACTION SUBMITTALS

- A. Submit electronic copies of each submittal unless otherwise indicated. Architect will return one copy.
- B. Product Data: Mark each copy to show applicable products and options. Include the following:
 - 1. Manufacturer's written recommendations, product specifications, and installation instructions.
 - 2. Wiring diagrams showing factory-installed wiring.
 - 3. Printed performance curves and operational diagrams.
 - 4. Testing by recognized testing agency.
 - 5. Compliance with specified standards and requirements.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data. Submit on sheets at least 8-1/2 by 11-inches but not larger than 24 by 36-inches. Include the following:
 - 1. Dimensions and identification of products.
 - 2. Fabrication and installation drawings and roughing-in and setting diagrams.
 - 3. Wiring diagrams showing field-installed wiring.
 - 4. Notation of coordination requirements.
 - 5. Notation of dimensions established by field measurement.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture and for comparison of these characteristics between submittal and actual component as delivered and installed. Include name of manufacturer and product name on label.
 - 1. If variation is inherent in material or product, submit at least three sets of paired units that show variations.

2.03 INFORMATIONAL SUBMITTALS

- A. Informational Submittals: Submit electronic copies of each submittal unless otherwise indicated. Architect will return one copy.
- B. Qualification Data: Include lists of completed projects with project names and addresses, names, and addresses of architects and owners, and other information specified.
- C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

2.04 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, schedule in a Gantt-Chart format and as outlined in the General Conditions.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
- C. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the Work performed as of planned and actual dates used for preparation of payment requests.
- D. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew size, and equipment required to achieve compliance, and indicate date by which recovery will be accomplished.

PART 3 – EXECUTION

3.01 SUBMITTAL REVIEW

- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Architect will review each action submittal, make marks to indicate corrections or modification required, will signify each submittal with an action stamp, and will signify appropriately to indicate action.
- C. Informational Submittals: Architect will review each submittal and will return a copy. Architect will forward each submittal to appropriate party.
- D. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

3.02 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule a minimum of one day before each regularly scheduled progress meeting.
 - 1. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribute copies of approved schedule to Owner/Architect, subcontractors, testing and inspecting agencies, and parties identified by Contractor with a need-to-know schedule responsibility. When revisions are made, distribute updated schedules to the same parties.

END OF ADMINISTRATIVE REQUIREMENTS

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

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

1.02 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Level: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.03 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

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- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installation of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specification require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 - 2. Notify Architect/Engineer seven days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Architect's/Engineer's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed, unless otherwise indicated.

1.04 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspection.
 3. Adequate quantities of representative sample of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and of test samples.
 5. Delivery of samples to testing agencies.
- F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1.05 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of the Owner, and as follows:

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

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with Contract Document requirements for cutting and patching in Section 01 70 00 "Execution and Closeout Requirements."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF QUALITY REQUIREMENTS

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Temporary utilities
 - b. Construction facilities
 - c. Temporary controls
 - d. Project Identification
- B. Related Work Specified Elsewhere:
 - 1. SECTION 01 26 00: Contract Modification Procedures
 - 2. SECTION 01 70 00: Execution and Closeout Requirements

1.02 ACTION SUBMITTALS

- A. Shop Drawings: Submit shop drawings of project identification sign indicating all required text, logos, typeface, and all other relevant information.

1.03 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.04 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

- A. The Contractor shall be permitted to utilize the existing Owner utilities at the site. These utilities include electric power and water. The Contractor shall provide temporary sanitary facilities for the workmen, temporary cell phones and temporary fire safety devices such as fire extinguishers.
- B. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use

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as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 – PRODUCTS

2.01 TEMPORARY FACILITIES

- A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.02 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

2.03 PROJECT IDENTIFICATION

- A. Project Identification Sign:
 - 1. Provide one painted sign of construction and design indicated below. Minimum of 3 feet by 5 feet in size.
 - 2. Content: The sign shall include the following information and format. Coordinate funding values and percentages with Architect.

STATE OF NEW HAMPSHIRE
Public Outdoor Recreation Site Development Aided by the Federal
LAND AND WATER CONSERVATION FUND
Administered by the
Nation Park Service
U.S. Department of the Interior

	<u>Funding</u>	
LWCF	50%	\$xxx,xxx
State of NH	50%	\$xxx,xxx
Total Project		\$xxx,xxx

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- 3. Logos: The sign shall bear both the LWCF Logo and the NH State Parks Logo, in color.
 - a. Logo Guidelines: The Logo shall be incorporated following the "LWCF Logo Guideline" available at: www.nps.gov/subjects/lwcf/lwcf-manual.htm

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- b. Logo File: The LWCF Logo is available at: www.nps.gov/subjects/lwcf/lwcf-manual.htm. The NH State Parks Logo is available from the Owners Representative upon request.
- 4. Lettering: Typeface – Times New Roman, Univers, Arial, or CG Omega.
- B. Design sign and structure to withstand 60 mile per hour wind velocity.
- C. Sign Painter: Experienced as professional sign painter with a minimum of three years' experience.
- D. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.
- E. Sign Materials:
 - 1. Structure and Framing: New, structurally adequate.
 - 2. Sign Surfaces: exterior grade plywood with medium density overlay, minimum 3/4 inches thick.

PART 3 – EXECUTION

3.01 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities. Permanent sanitary facilities installed under this Contract shall not be used during construction.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installation or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installation or elements being installed.

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- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installation or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

3.03 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30-feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 - 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Parking: Use designated areas of Owner's existing parking areas for construction personnel.

3.04 PROJECT IDENTIFICATION SIGN INSTALLATION

- A. Installation:
 - 1. Install sign prior to the start of construction.
 - 2. Erect at location of high public visibility adjacent to main entrance to site.
 - 3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
 - 4. Install sign plumb and level, with butt joints. Anchor securely.
 - 5. Paint exposed surfaces of sign, supports, and framing.
- B. Maintenance: Maintain signs and supports clean, repair deterioration and damage.
- C. Removal: Remove signs, framing, supports, and foundations at completion of project and restore area.

3.05 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

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- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in manner that will prevent people and animals from easily entering site except by entrance gate.
- D. Barricades, Warning Signs, and Lights: Comply with authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

3.06 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

END OF TEMPORARY FACILITIES AND CONTROLS

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Section includes administrative and procedural requirements for selection of products for use in Project.
1. The Work shall include, but shall not necessarily be limited to:
- a. Product delivery, storage, and handling
 - b. Manufacturers' standard warranties
 - c. Special warranties
 - d. Comparable products
- B. Related Work Specified Elsewhere:
- 1. SECTION 01 20 00: Price and Payment Procedures
 - 2. SECTION 01 25 00: Substitution Procedures

1.02 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- 1. Named products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Products: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.03 ACTION SUBMITTALS

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- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and drawing numbers and titles. Note that no substitutions for convenience are allowed per Section 01 25 00.
1. Include data to indicate compliance with the requirements specified in “Comparable Products” Article.
 2. Architect’s Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 01 30 00 “Administrative Requirements.”
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 30 00 “Administrative Requirements.”

1.04 QUALITY ASSURANCE

- A. Compatibility of Options: If contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer’s written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer’s original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.

2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by owner's construction forces. Coordinate location with owner.

1.06 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to owner.
 2. Special Warranty: Written warranty required by Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 70 00 "Execution and Closeout Requirements."

PART 2 – PRODUCTS

2.01 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.

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3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term “as selected”, Architect will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product complies with requirements. Comparable products or substitutions for Contractor’s convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor’s convenience will not be considered.
3. Products:
 - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements.
4. Manufacturers:
 - a. Restricted List: Where Specifications include a list of manufacturers’ names, provide a product by one of the manufacturers listed that complies with requirements.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers and/or products, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product names. Comply with requirements in “Comparable Products” Article for consideration of an unnamed product by one of the other named manufacturers. All effort has been made by the Architect to verify that Basis-of-Design Products meet the requirements of the Build America, Buy America Act, however, manufacturers may change their products as their needs dictate and as such the Contractor shall be responsible for determining compliance with the Act, and selecting equal products should the Basis-of-Design products no longer comply.

C. Visual Matching Specification: Where Specifications require “match Architect’s sample”, provide a product that complies with requirements and matches Architect’s sample. Architect’s decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 “Substitution Procedures” for proposal of product.

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- D. Visual Selection Specification: Where Specifications include the phrase “as selected by Architect from manufacturer’s full range” or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer’s product line that includes both standard and premium items.

2.02 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor’s request for comparable products when the following conditions are satisfied. Note that substitutions for convenience are not allowed per Section 01 25 00. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.

PART 3 – EXECUTION (Not Used)

END OF PRODUCT REQUIREMENTS

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Section includes general administrative and procedural requirements governing execution and closeout of the Work including, but not limited to, the following:
 - 1. Execution
 - 2. Cutting and patching
 - 3. Closeout procedures
 - 4. Operations and maintenance manuals
 - 5. Project record documents
- B. Related Work Specified Elsewhere:
 - 1. SECTION 01 10 00: Summary
 - 2. SECTION 01 30 00: Administrative Requirements

1.02 INFORMATIONAL SUBMITTALS

- A. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- B. Build America, Buy America: Submit Build America, Buy America Certificate of Compliance in accordance with Section 00 73 13 "Build America, Buy America requirements."

1.03 CLOSEOUT SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- B. Operations and Maintenance Manuals:
 - 1. Submit the following manuals. Manuals are to be placed into separate binders and electronic files, or if placed into a comprehensive volume, manuals shall be placed into separate sections clearly labeled with the manual title.
 - a. Product Maintenance Manual.
 - b. Systems and Equipment Manual.
 - 2. Format: Submit operations and maintenance manuals in the following format:
 - a. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - b. Two paper copies. Include complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
- C. Project Record Documents:

1. Record Drawings: Submit one paper-copy set of marked-up record prints and an annotated PDF electronic file of marked-up record prints.

1.04 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 3. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architects opinion, reduce the buildings aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.05 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractors List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
- a. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - b. Submit closeout submittals specified in other Division 1 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - c. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - d. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Architect. Label with manufacturers name and model number where applicable.
 - 1) Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number or related Specification Section. Obtain Architects signature or receipt of submittals.
 - e. Submit test/adjust/balance records.

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- f. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - a. Advise Owner of pending insurance changeover requirements.
 - b. Make final changeover of permanent locks and deliver keys to Owner. Advise Owners personnel of changeover in security provisions.
 - c. Complete startup and testing of systems and equipment.
 - d. Perform preventative maintenance on equipment prior to Substantial Completion.
 - e. Instruct Owners personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 - f. Advise Owner of changeover in heat and other utilities.
 - g. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 - h. Terminate and remove temporary facilities from project site, along with mockups, construction tools, and similar elements.
 - i. Complete final cleaning requirements, including touchup painting.
 - j. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificates will be issued.

1.06 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
 - 1. Submit a final Application for Payment according to Section 01 20 00 "Price and Payment procedures."
 - 2. Certified List of Incomplete Items: Submit certified copy of Architects Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy shall state that each item has been completed or otherwise resolved for acceptance.
 - 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
- B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

2.02 OPERATION AND MAINTENANCE DOCUMENTATION

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.
- B. Organization: Unless otherwise indicated, organize manuals into separate sections for each system and subsystem, and separate sections for each piece of equipment not part of a system.
- C. Organize data into three-ring binders with identification on front and spine of each binder, and envelopes for folded drawings. Include the following:
 1. Product Maintenance Manual: Organize manuals into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, including product color, pattern, and texture.
 2. Systems and Equipment Maintenance Manuals: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, including maintenance procedures, maintenance and service schedules, and testing and inspection schedules.
 3. Copies of warranties. Include procedures to follow and required notifications for warranty claims.

2.03 RECORD DRAWINGS

- A. Record Prints: Maintain a set of prints of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued. Mark to show actual installation where installation varies from that shown originally. Accurately record information in an acceptable drawing technique.
 1. Record drawings are to be updated at a minimum weekly.

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2. Review markings with Architect and Owner at Project Meetings.
 3. Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
- B. Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect.

PART 3 – EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
1. Comply with the "Underground Utility Damage Prevention System" per NH RSA 374 by notification to DIG-SAFE SYSTEM, Inc., of intent to excavate within 100 feet of an underground utility. Contact DIG-SAFE at least seventy-two (72) hours in advance of starting any excavation.
- B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.
- C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Space Requirements: Verify space requirements and dimension of items shown diagrammatically on Drawings.

3.02 CONSTRUCTION LAYOUT AND FIELD ENGINEERING

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
- C. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

3.03 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturers written instructions and recommendations for installing products in applications indicated.
- C. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- D. Templates: Obtain and distribute to the parties' involved templates for work specified to be factory prepared and field installed.
- E. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place. Where size and type of attachments are not indicated, verify size and type required for load conditions.
- F. Joints: Make joints uniform in width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- G. Use products, cleaners, and installation materials that are not considered hazardous.

3.04 CUTTING AND PATCHING

- A. Temporary Support: Provide temporary support of work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- D. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation using methods least likely to damage elements retained or

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adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installers written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering, and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
- E. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into adjoining construction in a manner that will minimize evidence of patching and refinishing.
 2. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance.

3.05 CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Dispose of materials lawfully.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
 3. Remove debris from concealed spaces before enclosing space.
- B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion:
1. Clean Project site, yard, and grounds, in areas disturbed by construction activities. Sweep paved areas; remove stains, spills, and foreign deposits. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 2. Remove labels that are not permanent.
 3. Clean transparent materials, including mirrors. Remove excess glazing compounds.
 4. Clean exposed finishes to a dust-free condition, free of stains, films, and foreign substances. Sweep concrete floors broom clean.
 5. Vacuum carpeted surfaces and wax resilient flooring.
 6. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and foreign substances. Clean plumbing fixtures. Clean light fixtures, lamps, globes, and reflectors.
 7. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

3.06 OPERATION AND MAINTENANCE MANUAL PREPARATION

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- A. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- B. Manufacturer's Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are unavailable and where the information is necessary for proper operation and maintenance of equipment or systems.
- C. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams.

3.07 DEMONSTRATION AND TRAINING

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system. Include detailed review of the following:
 - 1. Include instructions for basis of system design and operational requirements, review of documentation, emergency procedures, operations, adjustments, troubleshooting, maintenance, and repairs.

END OF EXECUTION AND CLOSEOUT REQUIREMENTS

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to provide all Selective Demolition as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.

The Work of this Section is not necessarily fully represented on the Drawings or specifically identified herein. The Contractor, either himself or through his various subcontractors, shall thoroughly review all documents and shall visit the site and existing building prior to bidding, as required to fully satisfy himself as to the types, locations and quantities of demolition work required for the complete and proper execution of the Work. No pleas of misunderstanding resulting from failure to adequately inspect existing conditions will be entertained and no additional expenses related thereto will be granted.

1. The Work shall include, but shall not necessarily be limited to:
 - a. Demolition of designated site improvements including paving, curbing, site walls, and utility structures.
 - b. Demolition of below-grade foundations and site improvements to depth to avoid conflict with new construction or site work.
 - c. Removal of hollow items or items which could collapse
 - d. Protection of site work and adjacent items
 - e. Disconnection, capping, and removal of utilities
 - f. Pollution control during building and selective demolition, including noise control
 - g. Selective demolition of interior partitions, systems, and building components designated to be removed.
 - h. Selective demolition of exterior façade, structures, and components designated to be removed.
 - i. Protection of portions of building adjacent to or affected by selective demolition
 - j. Removal of abandoned utilities and wiring systems
 - k. Notification to Owner of schedule of shut-off of utilities which serve occupied spaces.
 - l. Removal and legal disposal of materials
 - m. Protection of designated site improvements and adjacent construction
 - n. Interruption, capping or removal of utilities as applicable

1.02 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

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- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.03 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of the Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.04 QUALITY ASSURANCE

- A. Codes and Regulations: Comply with governing codes and regulations. Use experienced workers.

1.05 PROJECT CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect. Hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.06 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 – PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulation before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing conditions and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Disconnect, demolish, and remove plumbing and HVAC systems, equipment, and components indicated on Drawings to be removed.
 - a. Piping to be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Equipment to be Removed: Disconnect and cap services and remove equipment.
 - c. Equipment to be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - d. Equipment to be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

- e. Ducts to be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

3.03 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.04 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain fire watch during and for at least two hours after flame-cutting operations.
 - 6. Maintain adequate ventilation when using cutting torches.

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7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose off-site.
 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.
 4. Transport items to Owner's storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.05 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4-inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

3.06 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them.

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1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.07 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SELECTIVE DEMOLITION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Cast-In-Place Concrete as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Cast-In-Place Concrete
 - b. Formwork
 - c. Reinforcement
 - d. Materials, mixture design, placement, and finishes
- B. Related Work Specified Elsewhere:
 - 1. SECTION 07 92 00: Joint Sealants

1.02 REFERENCES (LATEST EDITIONS)

- A. ASTM listed standards by the American Society for Testing and Materials.
- B. ACI listed standards by the American Concrete Institute.
- C. CRSI listed standards by the Concrete Reinforcing Steel Institute.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of joints is subject to approval of the Architect.

- E. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and testing agency.
- B. Affidavit: Submit, upon request by Architect, manufacturer's, suppliers, and installer's affidavit stating that material or product provided complies with Contract Documents.
- C. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- E. Field quality-control reports.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs on the Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturers Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, in accordance with ACI CP-1, or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D1.4 M, "Structural Welding Code – Reinforcing Steel."

1.06 DELIVERY, STORAGE AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

1.07 PROJECT CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing action, or low temperatures.
 - 1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and as follows:
 - 1. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 – PRODUCTS

2.01 FORM-FACING MATERIALS

- A. Provide form-facing panels as defined by ACI and as required to achieve the specified Surface Finish and Surface Tolerance Class.
- B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4-inch, minimum.
- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, removable, or snap-off metal or glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1-inch to the plane of exposed concrete surfaces.

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2. Furnish ties that, when removed, will leave holes no larger than 1-inch in diameter in concrete surfaces.
3. Furnish ties with integral water-barrier plates to wall indicated to receive dampproofing or waterproofing.

2.02 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain-Steel Wire: ASTM A 82/A 82M, as-drawn.
- C. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.

2.03 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.04 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Material:
 1. Portland Cement: ASTM C 150, Type I or Type II, gray.
 2. Fly Ash: ASTM C618, Class F or C.
 3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
- C. Normal-Weight Aggregates: ASTM C33/C33M, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source.
 1. Maximum Coarse-Aggregate Size: 3/4-inch nominal.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

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1. Air-Entraining Admixture: ASTM C260/C260M
2. Water-Reducing Admixture: ASTM C494/C494M, Type A.
3. Mid-Range Water-Reducing Admixture: ASTM C494/C494M, Type A.
4. Retarding Admixture: ASTM C494/C494M, Type B.
5. Accelerating Admixture: ASTM C494/C494M, Type C.
6. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
7. Hydration-Control Admixture: ASTM C494/C494M, Type D.
8. Water-Reducing and Accelerating Admixture: ASTM C494/C494M, Type E.
9. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
10. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
11. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

E. Water: ASTM C 94/C 94M.

2.05 VAPOR RETARDERS

- A. Sheet Vapor Retarder: ASTM E 1745, Class A, except with maximum perm rating of 0.01 as tested after mandatory conditioning (ASTM E 154 sections 8, 11, 12, 13). Include manufacturer's recommended adhesive or pressure-sensitive tape.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. W.R. Meadows, Inc.; Perminator 15 mil.
 - b. Stego Industries, LLC; Stego Wrap 15 mil Class A.

2.06 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. MasterKure HB 200WB by Master Builders Solutions.
 - b. Curecrete Distribution Inc.; Ashford Formula.
 - c. Euclid Chemical Company (The), and RPM Company; Euco Diamond Hard.
 - d. L&M Construction Chemicals, Inc.; Seal Hard.
 - e. W.R. Meadows, Inc.; LIQUI-HARD.

2.07 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Moisture-Retaining Cover: AASHTO M-182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 10 oz./sq. yd. when dry.

- C. Water: Potable.

2.08 RELATED MATERIALS

- A. Expansion and Isolation Joint-Filler Strips: ASTM D1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Shore A durometer hardness range of 90 to 95 in accordance with ASTM D2240.

2.09 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by mass, of cementitious materials other than Portland cement in concrete as follows:
1. Fly Ash: 15 percent.
 2. Slag Cement: 25 percent.
 3. No slag or fly ash shall be permitted in mixtures to be used for polished concrete finishes.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by mass of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and –retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use accelerating or water-reducing and accelerating admixture when required by low temperatures, or other adverse winter placement conditions.
 4. Use water-reducing admixture in pumped concrete, concrete to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings and Foundation Walls: Normal-weight concrete.
1. Minimum Compressive Strength: 3000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 3. Slump Limit: 4 inches, or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

- B. Slabs-on-Ground (Interior): Normal-weight concrete mixture.
1. Minimum Compressive Strength: 4000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 3. Minimum Cementitious Materials Content: 540 lb/cu. yard.
 4. Slump Limit: 4 inches, or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 5. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.
- C. Slabs-on-Ground (Exterior): Normal-weight concrete mixture.
1. Minimum Compressive Strength: 4500 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 3. Minimum Cementitious Materials Content: 540 lb/cu. yard.
 4. Slump Limit: 4 inches, or 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 inch.
 5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
 6. Prohibit the use of fly ash and slag cement.

2.11 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75-minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60-minutes.

PART 3 – EXECUTION

3.01 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

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1. Class A, 1/8 inch for all surfaces exposed to view.
 2. Class C, 1/2 inch for other concrete surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
1. Install keyways, reglets, recesses, and the like, for easy removal.
 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior concrete corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkage's, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.03 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support the weight of concrete may be removed after cumulatively curing at not less than 50

deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for slabs and other structural elements that supports weight of concrete in place until concrete has achieved at least 70-percent of its 28-day design compressive strength.
 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.04 SHORES AND RESHORES

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- B. Plan sequence of removal of shores and re-shores to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.05 VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
1. Lap joints 6-inches and seal with manufacturer's recommended tape.

3.06 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcement bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

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- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.07 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 3. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
- C. Construction Joints in Slabs-On-Grade: Form weakened-plane contraction joints, sectioning concrete into areas indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Sawed Joints: Form contraction joints with an early-entry power saw using a dry-cut blade. Use a vacuum attached to the saw to remove saw cut residue. Cut 1/8-inch-wide joints to a depth of one fourth of the concrete thickness into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-On-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Terminate full-width joint-filler strips not less than 1/2-inch or more than 1-inch below finished concrete surface where joint sealants, specified in Section 07 92 00 "Joint Sealants," are indicated.
 - 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.08 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

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- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project side, subject to limitations of ACI 301.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6-inches into proceeding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess bleed water appears on surface. Do not further disturb slab surfaces before starting finishing operations.

3.09 FINISHING FORMED SURFACES

- A. As-Cast Finishes: Provide As-Cast finishes per ACI 301 and amended below:
 - 1. Surface Finish-1.0 (SF-1.0)
 - a. Patch voids larger than 1-1/2 inch wide or 1/2 inch deep
 - b. Remove projections larger than 1 inch
 - c. Tie holes need not be patched
 - d. Surface tolerance Class D (1-inch within 5 Ft.)
 - e. Mockup not required
 - 2. Surface Finish-2.0 (SF-2.0)
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep
 - b. Remove projections larger than 1/4 inch

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- c. Patch tie holes
 - d. Surface tolerance Class B (1/4-inch within 5 Ft.)
 - e. Provide mockup
- 3. Surface Finish-3.0 (SF-3.0)
 - a. Patch voids larger than 3/4 inch wide or 1/2 inch deep
 - b. Remove projections larger than 1/8 inch
 - c. Patch tie holes
 - d. Surface tolerance Class A (1/8-inch within 5 Ft.)
 - e. Provide mockup
- B. Rubbed Finish: Apply the following to as-cast concrete where indicated:
 - 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or other abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- C. Finish Schedule: Except as otherwise indicated on the Drawings, provide the finishes below:
 - 1. Surfaces entirely concealed from view (Ex. Inside face of frost walls, etc.): SF-1.0 with As-Cast Finish.
 - 2. Surfaces exposed to view (Ex. Exposed portion of frost walls): SF-2.0 with As-Cast Finish.
 - 3. Exterior surfaces fully exposed to view (Ex. Stairs, fully exposed foundation walls): SF-1.0 with Smooth-Rubbed Finish.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, re-straightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and re-straightening until surface is left with a uniform, smooth, granular texture.
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings of floor coverings.
 - 1. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-ground
 - 2. Finish and measure surface so gap at any point between concrete surface and an unlevelled, freestanding, 10-foot long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/4-inch.

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- D. Broom Finish: Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- E. Finish Schedule: Except where indicated otherwise on the Drawings, provide the finishes below:
 - 1. Floated Finish for:
 - a. Treads and platforms of exterior steps and stairs.
 - b. Slabs and fills over which waterproofing, roofing, vapor barrier, insulation, terrazzo, or resin bound flooring is required.
 - 2. Troweled Finish for:
 - a. Interior slabs that are exposed to view.
 - b. Treads and platforms of interior steps and stairs.
 - 3. Broom Finish for:
 - a. Exterior slabs. Texture as approved by Architect.

3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.12 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 305 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.1 lb/sq. ft. x h before and during finishing operations. Apply in accordance with manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

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1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
2. Curing Schedule: Curing compounds shall not be permitted prior written approval of Architect.
 - a. Vertical Concrete: Moisture Cure
 - b. Concrete surfaces to receive floor covering: Moisture Cure
 - c. Concrete surfaces to receive liquid floor treatment: Moisture Cure

3.13 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
 1. Remove sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
 2. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.

3.14 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2-inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances, finishing or other specified requirements. Repair and patch or replacement of defective concrete will be determined by the Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

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- C. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Repair defects on exposed formed surfaces as required to meet the specified as-cast Surface Finish.
 - 2. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- E. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01-inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14 days, correct high areas by grinding.
 - 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 - 4. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4-inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 - 5. Repair defective areas, except random cracks and single holes 1-inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 - 6. Repair random cracks and single holes 1-inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- F. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- G. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.16 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Contractor will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Headed bolts and studs.
 - 3. Verification of use of required design mixture.
 - 4. Concrete placement, including conveying and depositing.
 - 5. Curing procedures and maintenance of curing temperature.
 - 6. Verification of concrete strength before removal of shores and forms from beams and slabs.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 50 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof. All samples shall be taken at the point of placement.
 - 2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
 - 5. Compression Test Specimens: ASTM C31/C31M.
 - a. Cast and laboratory cure four 6- by 12-inch or five 4- by 8-inch cylinder specimens for each composite sample.
 - 6. Compressive-Strength Tests: ASTM C39/C39M.
 - a. A compressive-strength test shall be the average compressive strength from a set of two 6- by 12-inch or three 4- by 8-inch specimens obtained from same composite sample and tested at age indicated.
 - b. Test cylinders at 7 days and at 28 days.
 - 7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 - 8. Strength of each concrete mixture will be satisfactory, if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength (f_c') and no compressive-strength test value falls below f_c' by more than 500 psi when f_c' is below 5000 psi or by more than 0.10 f_c' when f_c' is more than 5000 psi.
 - 9. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive

- strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7 and 28-day tests.
10. Nondestructive Testing: Rebound hammer, ultrasonic, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 11. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
 12. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 13. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- D. Measure floor and slab flatness and levelness according to ASTM E1155 within 24 hours of finishing.
- E. Prepare test and inspection reports.
- 3.17 **PROTECTION**
- A. Protect liquid floor treatment from damage and wear during remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments Installer.

END OF CAST-IN-PLACE CONCRETE

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Rough Carpentry as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job. It is not intended that this Section specifically identify all Rough Carpentry required.
1. The Work shall include, but shall not necessarily be limited to:
- a. Framing with dimensional lumber
 - b. Shear wall panels
 - c. Wood blocking, cants, and nailers
 - d. Wood furring and grounds
 - e. Wood underlayment, decking and sheathing
 - f. Anchors and fasteners
- B. Related Work Specified Elsewhere:
- 1. SECTION 06 13 00: Heavy Timber Construction
 - 2. SECTION 06 20 00: Finish Carpentry
 - 3. SECTION 08 71 00: Door Hardware
 - 4. SECTION 10 14 00: Signage
 - 5. SECTION 10 21 00: Compartments and Cubicles
 - 6. SECTION 10 28 00: Toilet, Bath, and Laundry Specialties

1.02 DEFINITIONS

- A. Exposed Framing: Framing not concealed by other construction.
- 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
 - 3. RIS: Redwood Inspection Service
 - 4. SPIB: The Southern Pine Inspection Bureau
 - 5. WCLIB: West Coast Lumber Inspection Bureau
 - 6. WWPA: Western Wood Products Association

1.03 SPECIAL CONDITIONS

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- A. The Contractor shall carefully review the Drawings for additional technical requirements and details related to the Work of this Section. Particular attention shall be paid to the structural characteristics of framing materials.
- B. The Contractor shall pay special attention to the selection and installation of lumber and related materials for rough carpentry to remain exposed after completion. The best of the materials available shall be reserved for this purpose.
- C. The Contractor shall be responsible for carefully examining existing framing to remain, verifying that it is structurally sound and suitable for continued use and notifying the Architect upon the discovery of any conditions which suggest that existing materials may be rotted, checked, warped, termite infested, improperly installed or otherwise unsuitable for continued use.
- D. Where the Drawings indicate that new construction shall match existing construction, it is generally intended that modern, standard dimension lumber be used and scabbed or shimmed as required to accommodate any dimensional differences. Existing lumber may only be reused following the approval of the Architect. In any event, the lumber used shall be structurally suitable for its intended use.
- E. Coordinate the location of framing, blocking, nailers, furring, grounds, and similar supports for finish materials, millwork, casework, finish carpentry, equipment, hardware, and accessories so that the installation of finish work may be properly executed in compliance with the intended design requirements. Before starting installation of supports, carefully check all related shop drawings and submittals.

1.04 ACTION SUBMITTALS

- A. Lumber & Sheathing Schedule: Indicating lumber and sheathing sizes, species and grade, grading agency, moisture content and application location.
- B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details. MSDS sheets are not required to be submitted.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirement. Indicate type of preservative used and net amount of preservative retained.
 - 2. For products receiving waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
 - 3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
- C. Fastener Patterns: Full-sized templates for fasteners in exposed framing.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.05 INFORMATIONAL SUBMITTALS

- A. 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 ALSC Board or Review.
- B. Evaluation Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated wood
 - 2. Expansion anchors
 - 3. Metal framing anchors

1.06 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 – PRODUCTS

2.01 WOOD 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. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
 - 3. 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.
 - 4. Provide dressed lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber: 19 percent for 2-inch nominal thickness or less, no limit for more than 2-inch nominal thickness unless otherwise indicated.
- C. Wood Structural Panels:
 - 1. Plywood: PS 1, PS2 or APA PRP-108

2.02 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP A U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
 - 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
 - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by inspection agency.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 - 4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.
 - 5. Wood floor plates that are installed over concrete slabs-on-grade.

2.03 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 3 grade.
 - 1. Application: Interior partitions not indicated as load-bearing.
 - 2. Species: Spruce-pine-fir; NLGA, NeLMA, WCLIB, or WWPA
- B. Load-Bearing Partitions: No. 1 grade.
 - 1. Application: Exterior walls and interior load-bearing partitions.
 - 2. Species: Spruce-pine-fir; NLGA, WCLIB, or WWPA
- C. Ceiling Joists: No. 2 grade
 - 1. Species: Spruce-pine-fir; NLGA, NeLMA, WCLIB, or WWPA

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D. Joists, Rafters, and Other Framing Not Listed Above: No.1 grade.

1. Species: Spruce-pine-fir; NLGA, NeLMA, WCLIB, or WWPA

2.04 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking
2. Nailers
3. Cants
4. Furring
5. Grounds

B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber and any of the following species:

1. Hem-fir (north); NLGA
2. Mixed southern pine; SPIB
3. Spruce-pine-fir; NLGA
4. Hem-fir; WCLIB or WWPA
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA
6. Western woods; WCLIB or WWPA
7. Northern species; NLGA
8. Eastern softwoods; NeLMA

C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine; No. 3 grade; SPIB
2. Hem-fir or hem-fir (north); Standard or No. 3 Common grade; NLGA, WCLIB, or WWPA
3. Spruce-pine-fir (south) or spruce-pine-fir; Standard or No. 3 Common grade; NeLMA, NLGA, WCLIB, or WWPA
4. Eastern softwoods; No. 3 Common grade; NeLMA
5. Northern species; No. 3 Common grade; NLGA
6. Western woods; Standard or No. 3 Common grade; WCLIB or WWPA

D. For blocking not used for attachment of other construction, Utility, Stud or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment purpose.

E. 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.

F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

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2.05 SHEATHING

- A. Softwood plywood shall conform to the requirements of the latest edition of U.S. Product Standard PS-1, Construction and Industrial.
- B. Plywood thicknesses shall be as scheduled below, unless specifically noted otherwise on the Drawings.
 - 1. Exterior Plywood Wall Sheathing: 1/2-inch; APA Rated, Exposure 1 sheathing.
 - 2. Exterior Plywood Roof Sheathing @ Asphalt Shingles: 5/8-inch; APA Rated, Exposure 1 sheathing.
 - 3. Interior Wall Backing: 1/2-inch APA Rated, fire-retardant-treated sheathing.
 - 4. Miscellaneous Plywood (not specified elsewhere): Shall conform to the general applications and corresponding grades of softwood plywood as published in U.S. Product Standard PS-1 and shall be selected by means of its intended use, subject to Architect's approval.

2.06 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: DOC PS 1, Exterior, C-C Plugged Exposure 1, or C-D Plugged, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.07 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or Type 304 stainless steel.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers. All components to have a galvanized finish.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspection agency.

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1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

2.08 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by Simpson Strong-Tie Co., Inc. or approved equal.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those of products of manufacturers listed. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653 M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel TYPE B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
- D. Stainless-Steel Sheet: ASTM A 666, Type 304.
 1. Use for exterior locations and where indicated.

2.09 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.
- C. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
 1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

PART 3 – EXECUTION

3.01 INSTALLATION, GENERAL

- A. Set rough carpentry to required level 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

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- furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
 - C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
 - D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
 - E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
 - F. Do not splice structural members between supports unless otherwise indicated.
 - G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches on center.
 - H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches on center with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches on center. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal-thickness.
 - 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
 - 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet on center.
 - I. 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.
 - J. Comply with AWP A M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.

- K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners
 - 2. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code
- L. Use hot dipped galvanized steel common 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. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- M. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
 - 1. Comply with approved fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.
 - 2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
 - 3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.02 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attached items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preserved-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.03 WOOD FURRING INSTALLATION

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3 inch nominal-size furring horizontally and vertically at 24 inches on center.
- C. Furring to Receive Gypsum Board: Install 1-by-2 inch nominal-size furring vertically at 16 inches on center.

3.04 WALL AND PARTITION FRAMING INSTALLATION

- A. General: Provide double bottom plates and double top plates using members of 2-inch nominal thickness whose widths equal that of studs, except single bottom plate and top plate may be used for non-load-bearing partitions and a single top plate for load-bearing partitions where framing members bearing on partition are located directly over studs. Fasten plates to supporting construction unless otherwise indicated.
 - 1. For exterior walls, provide 2-by-6 inch nominal- size wood studs spaced 16 inches on center unless otherwise indicated.
 - 2. For interior partitions and walls, provide 2-by-6 inch nominal- or 2-by-4 inch nominal- size wood studs spaced 16 inches on center unless otherwise indicated.
 - 3. Provide continuous horizontal blocking at mid-height of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partition.
- B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.
- C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.
 - 1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal depth for openings 48 inches and less in width, 6-inch nominal depth for openings 48 to 72 inches in width, 8-inch nominal depth for openings 72 to 120 inches in width, and not less than 10-inch nominal depth for openings 10 to 12 feet in width.
 - 2. For load-bearing walls, provide double-jamb studs for openings 60 inches and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated.

3.05 CEILING JOIST AND RAFTER FRAMING INSTALLATION

- A. Ceiling Joists: Install ceiling joists with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
 - 1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- size or 2-by-4-inch nominal- size stringers spaced 48 inches on center crosswise over main ceiling joists.
- B. Rafters: Notch to fit exterior wall plates and toenail or use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. When rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.
- C. Provide collar beams (ties) as indicated or, if not indicated, provide 1-by-6-inch nominal- size boards between every third pair of rafters, but not more than 24 inches on center. Locate below ridge member, at third point of rafter span. Cut ends to fit roof slope and nail to rafters.

- D. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

3.06 PLYWOOD INSTALLATION

- A. Plywood materials shall be installed according to recommendations of the American Plywood Association.
- B. Plywood floor decking and underlayment shall be field glued and promptly screwed down tight. Glue shall comply with APA Specifications.
- C. Plywood roof sheathing shall be installed using manufacturer's standard galvanized "H" clips as recommended by the manufacturer.

3.07 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry become sufficiently wet that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF ROUGH CARPENTRY

SECTION 06 13 00

HEAVY TIMBER CONSTRUCTION

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Heavy Timber Construction as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Framing using timbers.
 - b. Structural design, fabrication, and installation of heavy timber beams, columns, and trusses.
 - c. Miscellaneous hardware for heavy timber construction, including but not limited to plate connectors, and bolts.
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry

1.02 ACTION SUBMITTALS

- A. Product Data: For timber connectors.
 - 1. For preservative-treated wood products include chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
 - 2. For timber connectors include installation instructions.
- B. Shop Drawings: For heavy timber framing. Show layout, dimensions of each member, and details of connections.
- C. Samples: Not less than 5 inches wide by 12 inches long, showing the range of variations to be expected in appearance, including surface texture, of wood products.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Certificates of Inspection: Issued by lumber-grading agency for exposed timber not marked with grade stamp.

1.04 DELIVERY, STORAGE AND HANDLING

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- A. Schedule delivery of materials to avoid extended on-site storage and to avoid delaying the Work.
- B. Store materials under cover and protected from weather and contact with damp or wet surfaces. Provide for air circulation within and around stacks and under temporary coverings.

PART 2 – PRODUCTS

2.01 TIMBER

- A. Comply with DOC PS 20 and with grading rules of lumber-grading agencies certified by ALSC's Board of Review as applicable.
 - 1. Factory mark each item of timber with grade stamp of grading agency.
 - 2. For exposed timber indicated to receive stained or natural finish, apply grade stamp to surfaces that are not exposed to view, or omit grade stamps and provide certificates of grade compliance issued by grading agency.
- B. Timber Species and Grade: Douglas fir-larch, Douglas fir-larch (north) or Hem-fir; Select Structural, NeLMA, NLGA, SPIB, WCLIB, or WWPA.
- C. Structural Properties: Provide species and grade that, for moisture content provided, complies with required structural properties.
- D. Moisture Content: Provide timber with 19 percent maximum moisture content at time of dressing or provide timber that is unseasoned at time of dressing but with 19 percent maximum moisture content at time of installation.
- E. Dressing: Provide timber that is surfaced four side (S4S), unless otherwise indicated.
- F. Exposed edges shall have a 3/4 inch wide chamfer.

2.02 TIMBER CONNECTORS

- A. Provide bolts, nuts, and washers as indicated on Drawings.
- B. Materials: Unless otherwise indicated, fabricate from the following materials:
 - 1. Structural-steel shapes, plates, and flat bars complying with ASTM A36/A36M.
 - 2. Round steel bars complying with ASTM A575, Grade M 1020.
 - 3. Hot-rolled steel sheet complying with ASTM A1011/A1011M, Structural Steel, Type SS, Grade 33.
- C. Hot-dip galvanize steel assemblies and fasteners after fabrication to comply with ASTM A123/A123M or ASTM A153/A153M.

2.03 MISCELLANEOUS MATERIALS

- A. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.

- B. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

2.04 JOINERY

- A. Joinery shall be in the best of the early English and early American traditions, designed for strength, shrinkage, checking, and twisting. All workmanship shall be of the very highest quality.
- B. As detailed on Structural Drawings.
- C. All joinery shall be accurately cut so as to make a neat, snug fit.

2.05 FABRICATION

- A. Shop fabricate members by cutting and restoring exposed surfaces to match specified surfacing. Finish exposed surfaces to remove planing or surfacing marks, and to provide a finish equivalent to that produced by machine sanding with No. 120 grit sandpaper.
- B. Coat crosscuts with end sealer.
- C. Seal Coat: After fabricating and surfacing each unit, apply a saturation coat of penetrating sealer on surfaces of each unit except for treated wood where the treatment included a water repellent.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. General: Erect heavy timber framing true and plumb. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.
 - 1. Install horizontal and sloping members with crown edge up and provide not less than 1 inch of bearing on supports. Provide continuous members unless otherwise indicated; tie together over supports with metal strap ties if not continuous.
 - 2. Handle and temporarily support heavy timber framing to prevent surface damage, compression, and other effects that might interfere with indicated finish.
- B. Cutting: Avoid extra cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.
- C. Fitting: Fit members by cutting and restoring exposed surfaces to match specified surfacing.
 - 1. Predrill for fasteners using timber connectors as templates.
 - 2. Finish exposed surfaces to remove planing or surfacing marks, and to provide a finish equivalent to that produced by machine sanding with No. 120 grit sandpaper.
 - 3. Coat crosscuts with end sealer.
 - 4. Where preservative-treated members must be cut during erection, apply a field-treatment preservative to comply with AWP A M4.

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- a. Use inorganic boron (SBX) treatment for members not in contact with the ground and continuously protected from liquid water.
 - b. Use copper naphthenate treatment for members in contact with the ground or not continuously protected from liquid water.
- D. Install timber connectors as indicated.
 - 1. Unless otherwise indicated, install bolts with same orientation within each connection and in similar connections.
 - 2. Install bolts with orientation as indicated or, if not indicated, as directed by Architect.

3.02 ADJUSTING

- A. Repair damaged surfaces and finishes after completing erection. Replace damaged heavy timber framing if repairs are not approved by Architect.

END OF HEAVY TIMBER CONSTRUCTION

SECTION 06 20 00

FINISH CARPENTRY

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Finish Carpentry as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
- a. Exterior standing and running trim
 - b. Interior standing and running trim
 - c. PVC trim
 - d. Wood door trim
 - e. Miscellaneous wood trim
- B. Related Work Specified Elsewhere:
- 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 07 46 23: Wood Siding
 - 3. SECTION 08 62 00: Unit Skylights
 - 4. SECTION 09 91 00: Painting
 - 5. SECTION 09 93 00: Staining and Transparent Finishing

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials, dimensions, profiles, textures, and colors and include construction and application details.
- 1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and amount of preservative retained. Include chemical treatment manufacturer's written instructions for finishing treated material.
 - 2. Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.
 - 3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced before shipment to Project site to levels specified.
 - 4. Include copies of warranties from chemical-treatment manufacturers for each type of treatment.
- B. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For the following, from ICC-ES:

1. Cellular PVC trim

1.04 QUALITY ASSURANCE

A. Perform work in accordance with AWI AWS Section 6 grades identified in Section.

B. Surface Burning Characteristics: Comply with the following when tested in accordance with NFPA 286.

1. During 40 kW Exposure: No flame spread to ceiling.
2. During 160 kW Exposure: No flame spread to perimeter of tested sample and no flashover.
3. Total Smoke Release: Maximum 1,000 cu m.

C. Apply label from agency approved by authority having jurisdiction to identify each preservative treated and fire retardant treated material.

D. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant-treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

E. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years' experience.

F. Fabricator Qualifications: Company specializing in fabricating products specified in this section with minimum three years' experience. Shop is a certified participant in AWI's Quality Certification Program.

1.05 DELIVERY, STORAGE AND HANDLING

A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

B. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Protect materials from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

1.06 PROJECT CONDITIONS

A. During and after installation of Work of this Section, maintain same temperature and humidity conditions in building spaces as will occur after occupancy.

1. Maintain relative humidity ranges indicated in AWI AWS Section 2

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- B. Weather Limitations for Exterior Work: Proceed with installation only when existing and forecast weather conditions permit work to be performed and at least one coat of specified finish can be applied without exposure to rain, snow, or dampness.
- C. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.
 - 1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that materials are mold damaged include, but are not limited to, fuzzy or blotchy surface contamination and discoloration.

1.07 WARRANTY

- A. Manufacturer's Warranty for Cellular PVC Trim: Manufacturer agrees to repair and replace trim that fails due to defects in manufacturing within specified warranty period. Failures include, but are not limited to, deterioration, delamination, and excessive swelling from moisture.
 - 1. Warranty Period: 25 years from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MATERIALS, GENERAL

- A. Environmental Quality Characteristics:
 - 1. Adhesives: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168; adhesives shall not contain urea formaldehyde
 - 2. Aerosol Adhesives: Maximum volatile organic compound content in accordance with GS-36
 - 3. Composite Wood Products: Contain no added urea-formaldehyde resins.
- B. VOC Limits for Installation Adhesives: Installation adhesives shall comply with the following limits for VOC content when calculated according to 40 CFR 59, subpart D (EPA Method 24):
 - 1. Wood Glues: 30 g/L
 - 2. Multipurpose Construction Adhesives: 70 g/L
 - 3. Contact Adhesive: 250 g/L.

2.02 EXTERIOR MATERIALS

- A. Exterior Softwood Lumber: Eastern White Pine or Southern Yellow Pine
 - 1. Grade: D & Better Select or C.
 - 2. Cut: Plain sawn.
 - 3. Finger Jointing: Not permitted.
- B. Exterior Preservative Treated Softwood Lumber: Southern yellow pine.
 - 1. Cut: Plain sawn

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- 2. Finger Jointing: Not permitted.
- C. Lumber Moisture Content Range: 9-15 percent

2.03 INTERIOR MATERIALS

- A. Interior Softwood Lumber: Eastern White Pine or Southern Yellow Pine
 - 1. Grade: D & Better Select or C.
 - 2. Cut: Plain sawn.
 - 3. Finger Jointing: Not permitted.
- B. Lumber Moisture Content Range: 9-15 percent.
- D. Interior Plastic Boards and Panels: Extruded, expanded PVC with a small-cell microstructure, recommended by manufacturer for interior use, made from UV- and heat-stabilized, rigid material.
 - 1. Density: Not less than 31 lb/cu. Ft.
 - 2. Heat Deflection Temperature: Not less than 130 deg F, according to ASTM D 648
 - 3. Coefficient of Thermal Expansion: Not more than 4.5×10^{-5} inches/inch x deg F
 - 4. Water Absorption: Not more than 1 percent, according to ASTM D 570
 - 5. Flame-Spread Index: 75 or less, according to ASTM E 84

2.04 WOOD TREATMENT

- A. Wood Preservative: Pressure Treatment: WDMA I.S.4
- B. Moisture Content after Treatment: Re-dried.
 - 1. Lumber: As specified for exterior and interior lumber
 - 2. Plywood: Maximum 15 percent

2.05 FABRICATION

- A. Fabricate finish carpentry to AWI AWS Section 6 Custom Grade.
- B. When necessary to cut and fit on site, fabricate materials with ample allowance for cutting. Furnish trim for scribing and site cutting.

2.06 FINISHES

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler matching surrounding surfaces and of types recommended for applied finishes.
- D. Stain, seal, and varnish exposed to view surfaces.

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- E. Seal internal surfaces and semi-concealed surfaces
- F. Seal surfaces in contact with cementitious materials.

2.07 ACCESSORIES

- A. Wall Adhesive: Cartridge type, compatible with wall substrate, capable of achieving durable bond.
- B. Fasteners and Anchors:
 - 1. Fasteners: ASTM A153/A153M, hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
 - 2. Nails and Staples: ASTM F1667
- C. Concealed Joint Fasteners: Threaded steel.
- D. Wood Filler: Solvent or oil base, tinted to match surface finish color.
- E. Specialty plastic or PVC plugs to conceal countersunk screws in PVC trim work.
- F. Adhesive for Cellular PVC Trim: Product recommended by trim manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this Section are placed and ready to receive this work.
- C. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Prime lumber and molding to be painted including both faces and edges unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 09 91 00 "Painting."

3.03 DEMOLITION

- A. Modify and extend existing finish carpentry installations using materials and methods as specified.

3.04 INSTALLATION

- A. Install work in accordance with AWI AWS Section 6 and Custom Grade and manufacturer's instructions.
- B. Set and secure materials and components in place, plumb and level.
- C. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 - 1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Coordinate exterior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate exterior finish carpentry.
- D. Carefully scribe work abutting other components, with maximum gaps of 1/32-inch. Do not use additional overlay trim to conceal larger gaps.
- E. Install cellular PVC trim to comply with manufacturer's written instructions.
 - 1. Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24-inches long except where necessary.
 - a. Use scarf joints for end-to-end joints.
 - b. Stagger end joints in adjacent and related members.
 - c. Fit exterior joints to exclude water. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Plane backs of casings to provide uniform thickness across joints, where necessary for alignment.
 - d. All exterior fasteners are to be countersunk and plugged with specialty PVC plugs designed for this purpose.
- F. Standing and Running Trim: Install trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available to greatest extent possible. Do not use pieces less than 96-inches long except where necessary.
 - 1. Use scarf joints for end-to-end joints.
 - 2. Stagger end joints in adjacent and related members.
 - 3. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.
 - 4. Install standing and running trim with no more variation from a straight line than 1/8-inch in 96-inches.
- G. Site Applied Wood Treatment:
 - 1. Brush apply one coat of preservative treatment on wood in contact with roofing and related metal flashings.

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2. Treat site-sawn cuts. Apply preservative to site-sawn cuts in accordance with WDMA I.S.4.
3. Allow preservative to dry prior to erecting members.

H. Preparation for Site Finishing:

1. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
2. Site Finishing: Refer to Section 09 91 00 "Painting" and 09 93 00 "Staining and Transparent Finishing"

3.05 TOLERANCES

A. Conform to AWI AWS Section 6 requirements for the following:

1. Smoothness
2. Gaps
3. Flushness
4. Flatness

B. Maximum Variation from Indicated Position: 1/16-inch.

C. Maximum Offset from Alignment with Abutting Materials: 1/32-inch.

END OF FINISH CARPENTRY

SECTION 06 61 16

SOLID SURFACING FABRICATIONS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Solid Surfacing Fabrications as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Countertops and sinks
 - b. Backsplashes, sideplashes and aprons
 - c. Wet wall cladding panels
 - d. Adhesives and Sealants
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 22 00 00: Plumbing
 - 3. SECTION 26 00 00: Electrical

1.02 DEFINITION

- A. Solid surface is defined as nonporous, homogenous material maintaining the same composition throughout the part with a composition of acrylic polymer, aluminum trihydrate filler and pigment.

1.03 ACTION SUBMITTALS

- A. Product Data:
 - 1. For each type of product indicated: Indicate product description, fabrication information and compliance with specified performance requirements.
 - 2. Product data for the following:
 - a. Mold resistance
 - 3. Manufacturers printed installation instructions and technical bulletins.
- B. Shop Drawings: Submit shop drawings indicating location of each item, dimensioned plans and elevations, large-scale details, attachment devices and other components.
 - 1. Show full-size details, edge details, attachments, etc.
 - 2. Show locations and sizes of furring, blocking, including concealed blocking, and reinforcement
 - 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, grab bars, brackets and other items installed in solid surface.
- C. Submit the following Samples:

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1. Color box containing physical samples of available colors. Printed color charts are not acceptable.
 2. For each type of product specified.
 - a. Submit minimum 6-inch by 6-inch sample in specified gloss.
 - b. Cut sample and seam together for representation of inconspicuous seam.
 - c. Indicate full range of color and pattern variation.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.04 QUALITY ASSURANCE

- A. Fabricators Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this project and whose products have a record of successful in-service performance for a minimum of three years and is certified in writing by the manufacturer.
- B. Installer Qualifications: Minimum of three years documented installation experience for projects similar in scope and complexity to the Project, and currently certified by the manufacturer as an acceptable installer.
- C. Applicable standards:
1. Fire test response characteristics:
 - a. Provide with the following Class A (Class I) surface burning characteristics as determined by testing identical products per UL 723 (ASTM E84) or other testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1) Flame Spread Index: 25 or less
 - 2) Smoke Developed Index: 450 or less

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver no components to project site until areas are ready for installation.
- B. Store components indoors prior to installation.
- C. Handle materials to prevent damage to finished surfaces.
1. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.06 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

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- B. Verify actual measurements and openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.07 WARRANTY

- A. Provide manufacturer's warranty against defects in materials.
 - 1. Warranty shall provide material and labor to repair or replace defective materials.
- B. Installed Warranty:
 - 1. Fabrication and installation must be performed by a manufacturer's certified Fabrication/Installation source.
 - 2. This warranty shall cover all fabrication and installation performed by the certified/approved source subject to the specific wording contained in the Installed Warranty Card.
- C. Manufacturer's Warranty Period: Ten years from the date of substantial completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the following:
 - 1. Corian Surfaces from DuPont Company (basis of design)
 - 2. Wilsonart
 - 3. Formica Corporation
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 SOLID POLYMER COMPONENTS

- A. Cast, nonporous, filled polymer, not coated, laminated, or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
- B. Superficial damage to a depth of 0.010 inch shall be repairable by sanding and/or polishing.
- C. Thickness: 1/2 inch for countertops, 1/4 inch for wall panels
- D. Edge treatment: As indicated on drawings.

2.03 INTEGRAL SINKS

- A. Composition: Cast, nonporous, filled polymer, not coated, laminated, or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.

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B. Product Selections: As follows; specified dimensions as inside bowl dimensions:

1. Model Number: 810 ADA-Compliant; 16-1/2 inches long by 13-1/8 inches wide by 5-3/8 inches deep.
2. Color: As selected by Owner from manufacturer's full range.
3. Mounting: Seamed undermount.

2.04 BACK AND SIDE SPLASHES

A. Backsplash: Applied

B. Sidesplash: Applied

2.05 PERFORMANCE CHARACTERISTICS

- A. Tensile Strength: 6,000 psi; ASTM D 638
- B. Tensile Modulus: 1.5×10^{-6} psi; ASTM D638
- C. Tensile Elongation: 0.4% minimum; ASTM D 638
- D. Flexural Strength: 10,000 psi; ASTM D 790
- E. Flexural Modulus: 1.2×10^{-6} psi; ASTM D 790
- F. Hardness: 56; Barcol Impressor, ASTM D 2583
- G. Thermal Expansion: 1.80×10^{-5} in./in. F; ASTM D 696
- H. Light Resistance: (Xenon Arc) No effect; NEMA LD 3-2000 Method 3.3
- I. Wear and Cleanability: Passes; ANSI Z124.3 & Z124.6
- J. Stain Resistance: Passes; ANSI Z124.3 & Z124.6
- K. Fungus and Bacteria Resistance: Does not support microbial growth; ASTM G21 & G22
- L. Boiling Water Resistance: No visible change; NEMA LD 3-2000 Method 3.5
- M. High Temperature Resistance: No change; NEMA LD 3-2000 Method 3.6
- N. Izod Impact: 0.26 ft.-lbs./in. of notch; ASTM D256 (Method A)
- O. Ball Impact Resistance: No fracture-1/2 lb. ball: 1/4 inch slab-36 inch drop, 1/2 inch slab-144 inch drop; NEMA LD 3-2000 Method 3.8
- P. Weatherability: $\Delta E^*_{94} < 5$ in 1,000 hrs.; ASTM G 155
- Q. Specific Gravity: 1.7
- R. Moisture Absorption: Less than 0.25 percent; ASTM D 570, long term
- S. Toxicity: 99 (solid colors), 66 (patterned colors); Pittsburgh Protocol Test ("LC50" Test)
- T. Flammability: Class I and Class A; ASTM E 84, NFPA 255 & UL 723
- U. Flame Spread Index: <25
- V. Smoke Developed Index: <25

2.06 ACCESSORIES

- A. Joint Adhesive: Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.
- B. Sealant: Manufacturer's standard mildew-resistant, FDA-compliant, NSF 51-compliant (food zone – any type), UL-listed silicone sealant in colors matching components.

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- C. Sink/Lavatory Mounting Hardware: Manufacturer's standard bowl clips, panel inserts and fasteners for attachment of undermount sinks/lavatories.
- D. Silicone Adhesive: Manufacturer's recommended 100% silicone adhesive with minimum 50% movement capability. Subject to compliance with requirements, provide products by one of the following:
 - 1. Dow
 - 2. GE
 - 3. Permatex

2.07 FACTORY FABRICATION

- A. Shop Assembly:
 - 1. Fabricate components to the greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.
 - 2. Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.
 - a. Reinforce with strip of solid polymer material, 2 inches wide.
 - 3. Provide factory cutouts for all plumbing fittings and bath accessories as indicated on the drawings.
 - 4. Route and finish component edges with clean, sharp returns.
 - a. Route cutouts, radii, and contours to template.
 - b. Smooth edges.
 - c. Repair or reject defective and inaccurate work.

2.08 FINISHES

- A. Color: As selected by Architect from manufacturer's full color and price ranges.
- B. Finish: Provide surfaces with a uniform finish: Matte; gloss range of 5-20.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with fabricator 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.

3.02 COUNTERTOP INSTALLATION

- A. Install components plumb, level, and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
 - 1. Provide product in the largest pieces available.

2. Form field joints using manufacturer's recommended joint adhesive, with joints inconspicuous in finished work.
 - a. Exposed joints/seams shall not be allowed
 3. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.
 4. Cut and finish component edges with clean, sharp returns.
 5. Route radii and contours to template.
 6. Anchor securely to base cabinets or other supports.
 7. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
 8. Carefully dress joints smooth, remove surface scratches and clean entire surface.
 9. Install countertops with no more than 1/8-inch sag, bow or other variation from a straight line.
- B. Applied Backsplashes and Applied Sidesplashes:
1. Install applied backsplashes using manufacturer's standard color-matched silicone sealant.
 2. Adhere applied sidesplashes to countertops using manufacturer's standard color-matched silicone sealant.
- C. Integral Sinks/Vanities:
1. Provide solid surface material bowls and/or lavatory sinks with overflows in locations shown on the drawings.
 2. Secure sinks and lavatory bowls to tops using manufacturer's recommended sealant, adhesive and mounting hardware to maintain warranty.

3.03 WET WALL CLADDING PANELS INSTALLATION

- A. Install wall cladding panels plumb, level, and true according to approved shop drawings and manufacturer's published installation instructions and technical bulletins. Shim as required during installation process. Use woodworking and specialized fabrication tools acceptable to manufacturer.
- B. Route all wall cladding panels to size; sawcuts are not permissible. Cutouts must also be routed with eased edges.
- C. Provide eased panel edges where specified silicone sealant is required to fill gap between panels.
- D. Attach wall cladding panels to substrate with manufacturer's recommended silicone adhesive. Apply silicone adhesive as minimum 1/8-inch beads in locations and spacing according to manufacturer's published installation instructions and technical bulletins. Adhesive bead size shall be determined based on manufacturers recommendations for expansion and contraction. Provide temporary bracing until adhesive has set to proper strength. Promptly remove excess adhesive.

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- E. Form wall cladding joint seams for multiple panels with specified seam adhesive, with joints inconspicuous in finished work. Exposed joints/seams will not be allowed. Seam in locations shown on approved shop drawings and acceptable to manufacturer. Promptly remove excess adhesive. Joints shall be installed as follows:
 - 1. Panel to Panel Joints: Adhesive tongue and groove hard seam.
 - 2. Outside Corners: Silicone seam.
 - 3. Inside Corners: 2 1/2-inch baffle with silicone filled corner.
 - 4. Wall to Floor: As detailed on construction documents.
 - 5. Wall to Ceiling: Silicone filled. Maintain maximum 1/4-inch gap at top of panels.
- F. Provide specified silicone sealant to fill gaps in the following locations and as required by manufacturer:
 - 1. Wall panel joints indicated to receive silicone sealant.
 - 2. At inside corners.
 - 3. At interface with tub or shower pan.
 - 4. Between finished floor and ceiling for full height cladding.
 - 5. Not greater than 12 feet on center for any wall cladding length or height.
- G. Wall-mounted accessories must be completely supported by substrate wall framing, not wall cladding panels. Provide shims as required for proper installation and alignment with finished wall surface.
- H. Install solid surfacing moldings with specified silicone adhesive. Promptly remove excess adhesive.

3.04 PROTECTION

- A. Keep components clean during installation.
- B. Remove adhesives, sealants, and other stains.

END OF SOLID SURFACING FABRICATIONS

SECTION 06 64 00

PLASTIC PANELING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Plastic Paneling as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Glass-fiber reinforced plastic (FRP) wall paneling
 - b. Accessories and trim
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 06 20 00: Finish Carpentry
 - 3. SECTION 07 92 00: Joint Sealants

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Submit shop drawings of each wall showing locations of paneling and trim members with respect to all discontinuities in the wall elevation.
- C. Selection Samples: Submit manufacturer's standard physical selection samples representing manufacturer's full range of available colors and patterns.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 200 or less.
 - 2. Smoke-Developed Index: 450 or less.
 - 3. Testing Agency: Acceptable to authorities having jurisdiction.

1.04 DELIVERY, STORAGE AND HANDLING

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- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.05 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.06 WARRANTY

- A. Furnish one year guarantee against defects in material and workmanship.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products by Marlite, or comparable products by Crane Composites, Fibertech, Glasteel, Nudo, or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 PLASTIC SHEET PANELING

- A. General: Gelcoat-finished, glass-fiber reinforced plastic panels complying with ASTM D 5319.
 - 1. Basis of Design Product: Marlite Standard FRP
 - 2. Nominal Thickness: Not less than 2.3mm (0.090 inches).
 - 3. Surface Texture: As selected by Architect from manufacturer's full range.
 - 4. Color: As selected by Architect from manufacturer's full range.

2.03 ACCESSORIES

- A. Trim Accessories: Manufacturer's standard narrow one-piece extrusions designed to retain and cover edges of panels.
 - 1. Material: Vinyl
 - 2. Color: As selected by Architect from manufacturer's full range.
 - 3. Trim Schedule:
 - a. Top Edges and Bottom Edges: Marlite M370.
 - b. Inside Corners: Marlite M350.
 - c. Outside Corners: Marlite M360.
 - d. Vertical and Horizontal Joints: Sealant Joint (no trim).
- B. Exposed Fasteners: Not Permitted.

- C. Adhesive: As recommended by plastic paneling manufacturer.
 - 1. Adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Sealant: Single-component, mildew-resistant, neutral curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements of Section 07 92 00 "Joint Sealants." Color matched to panels.

PART 3 – EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. Remove wallpaper, vinyl wall covering, loose or soluble paint, and other materials that might interfere with adhesive bond.
- B. Prepare substrate by sanding high spots and filling low spots as needed to provide flat, even surface for panel installation.
- C. Clean substrates of substances that could impair bond of adhesive, including oil, grease, dirt, and dust.
- D. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- E. Lay out paneling before installing. Locate panel joints to provide equal panels at ends of walls not less than half the width of full panels.
 - 1. Mark plumb lines on substrate at panel joint locations for accurate installation.
 - 2. Locate trim accessories to allow clearance at panel edges according to manufacturer's written instruction.

3.03 INSTALLATION

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install panels in a full spread of adhesive. Drive rivets and exposed fasteners are not permitted.
- C. Vertical and Horizontal Joints: Maintain 1/8-inch space between panels. Apply masking tape to each side of joint and fill joint with color matching sealant. Finish joint smooth, allow to cure, and remove excess sealant.

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- D. Install trim accessories with adhesive and nails or staples. Do not fasten through panels.
- E. Fill grooves in trim accessories with sealant before installing and bed inside corner trim in a bead of sealant.
- F. Maintain uniform space between panels and wall fixtures. Fill space with sealant.
- G. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.
- H. Remove excess sealant and smears as paneling is installed. Clean with a solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF PLASTIC PANELING

SECTION 07 25 00

WEATHER BARRIERS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Weather Barriers as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Weather barrier membranes
 - b. Seam tape
 - c. Flexible flashing
 - d. Fasteners
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 07 46 23: Wood Siding

1.02 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used, including:
 - 1. Preparation instructions and recommendations
 - 2. Storage and handling requirements and recommendations
 - 3. Installation methods
 - 4. Design data and test reports
- B. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

1.04 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

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- B. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store weather barrier materials as recommended by weather barrier manufacturer.

1.05 SCHEDULING

- A. Review requirements for sequencing of installation of weather barrier assembly with installation of windows, doors, louvers, and flashings to provide a weather-tight barrier assembly.
- B. Schedule installation of weather barrier materials and exterior cladding within nine months of weather barrier assembly installation.

1.06 WARRANTY

- A. Provide manufacturer's warranties:
 - 1. Weather barrier manufacturer's warranty for weather barrier for a period of ten (10) years from date of substantial completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products from DuPont which is located at: Chestnut Run Plaza 728, Wilmington, DE 19805, or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 WEATHER BARRIER

- A. Basis of Design: Spunbonded polyolefin, non-woven, non-perforated. Weather Barrier is based upon DuPont Tyvek CommercialWrap and related assembly components.
- B. Performance Characteristics:
 - 1. Air Penetration: 0.001 cfm/sf at 75 Pa when tested in accordance with ASTM E 2178. Type 1 when tested in accordance with ASTM E 1677. ≤ 0.04 cfm/ft @ 75 Pa when tested in accordance with ASTM E 2357.
 - 2. Water Vapor Transmission: 30 perms, when tested in accordance with ASTM E 96, Method B.
 - 3. Water Penetration Resistance: 235 cm when tested in accordance with AATCC Test Method 127
 - 4. Basis Weight: 2.4 oz. /square yard, when tested in accordance with TAPPI Test Method T-410.
 - 5. Air Infiltration Resistance: Air infiltration at >750 seconds, when tested in accordance with TAPPI Test Method T-460
 - 6. Tensile Strength: 33/41 lbs./in., when tested in accordance with ASTM D 822, Method A

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7. Surface Burning Characteristics: Class A, when tested in accordance with ASTM E 84.
Flame Spread: 15, Smoke Developed: 25

2.03 ACCESSORIES

- A. Seam Tape: Pressure-sensitive plastic tape recommended by weather barrier manufacturer for sealing joints and penetrations in weather barrier.
- B. Fasteners:
 1. Wood Frame Construction: Weather Barrier manufacturer's Caps; #4 nails with large 1 inch plastic cap fasteners or 1 inch minimum plastic cap staple with leg length sufficient to achieve a minimum penetration of 5/8 inch into the wood stud.
- C. Sealants: Provide sealants that comply with ASTM C 920, elastomeric polymer sealant to maintain watertight conditions, as recommended by weather barrier manufacturer.
- D. Adhesives: Provide adhesive recommended by weather barrier manufacturer as required for project conditions.
- E. Primers: Provide flashing manufacturer's recommended primer to assist in adhesion between substrate and flashing.
- F. Flexible Flashing:
 1. Flexible membrane flashing materials for window openings and penetrations as manufactured by weather barrier manufacturer.
 2. Straight flashing membrane materials for flashing windows and doors and sealing penetrations such as masonry ties, etc. as manufactured by weather barrier manufacturer.
 3. Dual-sided flashing membrane materials for brick mold and non-flanged windows and doors as manufactured by weather barrier manufacturer.
 4. Preformed three-dimensional shapes to complete the flashing system used in conjunction with Thru-Wall flashing.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer's recommended tolerances prior to installation of weather barrier and accessories.

3.02 INSTALLATION

- A. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations
- B. Install weather barrier prior to installation of windows and doors.

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- C. Start weather barrier installation at a building corner, leaving 6 to 12 inches of weather barrier extended beyond corner to overlap.
- D. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level
- E. Window and Door Openings: Extend weather barrier completely over openings.
- F. Overlap weather barrier.
 - 1. Exterior corners: minimum 12-inches
 - 2. Seams: minimum 6-inches
- G. Weather Barrier Attachment:
 - 1. Wood Frame Construction: Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer's recommended fasteners, space 6 to 18 inches vertically on center along stud line, and 24 inches on center maximum horizontally.

3.03 SEAMING

- A. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
- B. Seal any tears or cuts as recommended by weather barrier manufacturer.

3.04 OPENING PREPARATION

- A. Flush cut weather barrier at edge of sheathing around full perimeter of opening.
- B. Cut a head flap at 45-degree angle in the weather barrier at head to expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.

3.05 FLASHING

- A. Cut 9 inch wide Flexible Flashing a minimum of 12 inches longer than width of sill rough opening.
- B. Cover horizontal sill by aligning Flexible Flashing edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
- C. Fan Flexible Flashing at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges.
- D. Apply 9-inch wide strips of straight flashing at jambs. Align flashing with interior edge of jamb framing. Start straight flashing at head of opening and lap sill flashing down to the sill.
- E. Spray-apply primer to top 6 inches of jambs and exposed sheathing.

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- F. Install flexible flashing at opening head using same installation procedures used at sill. Overlap jamb flashing a minimum of 2 inches.
- G. Position weather barrier head flap across head flashing. Adhere using 4-inch wide straight flashing over the 45-degree seams.

3.06 PROTECTION

- A. Protect installed weather barrier from damage.

END OF WEATHER BARRIERS

SECTION 07 31 13

ASPHALT SHINGLES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Asphalt Shingles as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Asphalt Shingles
 - b. Underlayment
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 08 62 00: Unit Skylights

1.02 DEFINITIONS

- A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of asphalt shingle, ridge and hip cap shingles, ridge vent and exposed valley lining indicated.
 - 1. Include similar Samples of trim and accessories involving color selection.
- C. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.
- C. Research/Evaluation Reports: For each type of asphalt shingle required, from the ICC.

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- D. Warranties: Sample of special warranties
- E. Maintenance Data: For each type of asphalt shingle to include in maintenance manuals.

1.05 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. Asphalt Shingles: 100 square feet of each type, in unbroken bundles.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.
 - 1. Exterior Fire-Test Exposure: Class A or Class C; ASTM E 108 or UL 790, for application and roof slopes indicated.

1.07 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
 - 1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.
- C. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.08 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install asphalt shingles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.09 WARRANTY

- A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following
 - a. Manufacturing defects.
 - b. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.
 2. Material Warranty Period: 50 years from date of Substantial Completion, prorated, with first 12 years non-prorated.
 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 110 mph for 10 years from date of Substantial Completion.
 4. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.
 5. Workmanship Warranty Period: 10 years from date of Substantial Completions
- B. Special Project Warranty: Roofing Installer's Warranty, or warranty form at end of this Section, signed by roofing installer, covering the Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials, workmanship or weathertightness, within specified warranty period.
1. Warranty Period: Five years from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products manufactured by CertainTeed Corporation, or comparable products by Atlas, Iko, GAF Materials Corporation, Owens Corning or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced and self-sealing.
1. Basis of Design Product: Subject to compliance with requirements, provide CertainTeed Landmark Pro.
 2. Butt Edge: Notched cut
 3. Weight per Square: 240 to 267 lb
 4. Strip Size: Manufacturer's standard
 5. Algae Resistance: Granules treated to resist algae discoloration
 6. Color and Blends: As selected by Architect from manufacturer's full range

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- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles or site-fabricated units cut from asphalt shingle strips. Trim each side of lapped portion of unit to taper approximately 1-inch.

2.03 UNDERLAYMENT MATERIALS

- A. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40-mil-thick, slip resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied.
 - 1. Basis of Design Product: Subject to compliance with requirements, provide Grace, W.R. & Co., Ice-and-Water Shield, or comparable product by one of the following:
 - a. Carlisle Coatings & Waterproofing, Inc.
 - b. Henry Company
 - c. Johns Manville
 - d. Owens Corning
 - e. Protecto Wrap Company
- B. Felt: ASTM D 226/D 226 M, asphalt saturated organic felts, non-perforated.

2.04 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch diameter, barbed shank, sharp-pointed, with a minimum 3/8-inch diameter flat head and of sufficient length to penetrate 3/4-inch into solid wood decking or extend at least 1/8-inch through OSB or plywood sheathing.
 - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch minimum diameter.

2.05 METAL FLASHING AND TRIM

- A. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
 - 1. Sheet Metal: Anodized aluminum
 - 2. Drip Edges: F- or D-Style. Fabricate in lengths not exceeding 10 feet with 4-inch roof-deck flange and 1-1/2 inch fascia flange with 3/8-inch drip at lower edge.
 - 3. Step Flashings: Fabricate with a headlap of 2-inches and a minimum extension of 5-inches over the underlying asphalt shingle and up the vertical surface.

4. Cricket Flashings: Fabricate with concealed flange extending a minimum of 24-inches beneath upslope asphalt shingles and 6-inches beyond each side of skylight and 6-inches above the roof plane.
- B. Vent Pipe Flashings: Aluminum base with self-sealing rubber collar. Sized to fit pipe.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2-inches over underlying course. Lap ends a minimum of 4-inches. Stagger end laps between succeeding courses at least 72-inches. Fasten with felt-underlayment nails.
1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3-inches in direction that sheds water. Lap ends of felt not less than 6-inches over self-adhering sheet underlayment.
 2. Install fasteners at no more than 36-inches on center.
- C. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated on Drawings, lapped in direction to shed water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24-inches between courses. Roll laps with roller. Cover underlayment within seven days.
- D. Concealed, Closed-Cut Valley Lining: Comply with NRCA's recommendations. Install a 36-inch wide felt underlayment centered in valley. Fasten to roof deck with roofing nails.

1. Install a 36-inch wide strip of granular-surfaced valley lining centered in valley, with granular-surface face up. Lap ends of strips at least 12-inches in direction to shed water, and seal with asphalt roofing cement. Fasten to roof deck with roofing nails.

3.03 METAL FLASHING INSTALLATION

- A. General: Install metal flashings according to ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Step Flashings: Install with a headlap of 2-inches and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.
- C. Cricket Flashings: Install against the roof-penetrating element extending concealed flange beneath up slope asphalt shingles and beyond each side.
- D. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck
- E. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.
- F. Pipe Flashings: Form flashings around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.04 ASPHALT SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.
 1. Extend asphalt shingles 1/2-inch over fascia at eaves and rakes.
 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Fasten asphalt shingle strips with a minimum of six roofing nails located according to manufacturer's written instructions.
 1. Where roof slope exceeds 20:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
 3. When ambient temperature during installation is below 50 degrees F, seal asphalt shingles with asphalt roofing cement spots.

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- E. Woven Valleys: Extend succeeding asphalt-shingle courses from both sides of valley 12-inches beyond center of valley, weaving intersecting shingle-strip courses over each other. Use one-piece shingle strips without joints in valley.
 - 1. Do not nail asphalt shingles within 6-inches of valley center.
- F. Ridge Vent: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- G. Ridge Shingle: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
 - 1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

3.05 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS **<Insert name>** of **<Insert address>**, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following Project:
 - 1. Owner: **<Insert name of Owner>**
 - 2. Address: **<Insert address>**
 - 3. Building Name/Type: **<Insert information>**
 - 4. Address: **<Insert address>**
 - 5. Area of Work: **<Insert information>**
 - 6. Acceptance Date: **<Insert date>**
 - 7. Warranty Period: **<Insert date>**
 - 8. Expiration Date: **<Insert date>**
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period.
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he shall, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a weathertight condition.
- D. This Warranty is made subject to the following terms and conditions:
 - 1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. Lightning;
 - b. Peak gust wind speed exceeding 110 mph;
 - c. Fire;
 - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;

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- f. Vapor condensation on bottom of roofing; and
 - g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to work covered by this Warranty and is liable for consequential damages to building or building contents resulting from leaks or faults or defects of roofing work.
 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of such alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified the Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 6. Owner shall promptly notify Roofing installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of leaks, defects, or deterioration.
 7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed the **<Insert day>** day of **<Insert month>**, **<Insert year>**.
1. Authorized Signature: **<Insert signature>**
 2. Name: **<Insert name>**
 3. Title: **<Insert title>**

END OF ASPHALT SHINGLES

SECTION 07 46 23

WOOD SIDING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Wood Siding as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Clapboard siding
 - b. Wood panel siding
 - c. Rainscreens
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 06 20 00: Finish Carpentry
 - 3. SECTION 07 25 00: Weather Barriers
 - 4. SECTION 09 91 00: Painting
 - 5. SECTION 09 93 00: Staining and Transparent Finishing

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product specified.
- B. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Minimum 5 years' experience harvesting and milling forest products.
- B. Installer Qualifications: Minimum 2 years' experience installing similar products.
- C. Grading Agency Qualifications: An independent testing and inspecting agency recognized by authorities having jurisdiction as qualified to label siding for compliance with referenced grading rules.

1.04 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

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- B. Store siding in a dry, well-ventilated, weathertight location according to manufacturer's written instructions.

1.05 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit siding installation and related work to be performed according to manufacturer's written instructions.
 - 1. Field-Finished Siding: Proceed with installation of siding only when existing and forecast weather conditions permit installation and the immediate application of at least one coat of specified finish on siding before it is exposed to rain, snow, or dampness.
 - a. Proceed with installation only after base or primer coat has been applied to every surface of siding units and has dried.

1.06 WARRANTY

- A. Special Materials Warranty: Manufacturer's warranty in which manufacturer agrees to repair or replace products that fail in materials within specified warranty period. Material failures include manufacturing defects that result in leaks.
 - 1. Materials Warranty Period: Limited lifetime from date of Substantial Completion

PART 2 – PRODUCTS

2.01 CLAPBOARD SIDING

- A. General: Beveled wood clapboard siding
 - 1. Species: Eastern White Pine
 - 2. Pattern: Waney Edge Bevel
 - 3. Grade: D & Better Select
 - 4. Exposure: 8-inches
 - 5. Finish: Resawn
 - 6. Moisture: Kiln-dried to approximately 12%
 - 7. Edge: Square butt
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.01 WOOD PANEL SIDING

- A. General: Patterned wood siding.
 - 1. Pattern: Texture 1-11
 - 2. Moisture: Kiln-dried to approximately 12%
 - 3. APA rated.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 ACCESSORIES

- A. Flashing: Provide factory painted aluminum flashing at window and door heads and where indicated.
 - 1. Finish for Aluminum Flashing: High-performance organic finish (Kynar pvf paint system). Color as selected by Architect from manufacturers full range.
- B. Fasteners:
 - 1. For fastening wood, use stainless steel siding nails of sufficient length to penetrate a minimum of 1-inch into substrate.
 - 2. For fastening aluminum flashings, use stainless steel or aluminum fasteners.
 - 3. For fastening to cedar shingles use rust-resistant aluminum or stainless steel nails or hot-dip galvanized box nails.

2.03 RAINSCREEN

- A. Basis of Design: Products manufactured by Benjamin Obdyke Incorporated, which is located at: 400 Babylon Road, Suite A, Horsham, PA 19044, or approved equal.
 - 1. Basis of Design Product: Slicker Classic
 - a. Description: Vertically-channeled three-dimensional matrix in roll form.
 - b. Material: Nylon (up to 10% post-industrial recycled content).
 - c. Thickness: 0.25-inches
 - d. Matrix Design: 8 channels per 4-inches. Two channels per inch.

PART 3 – EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLATION, GENERAL

- A. Comply with siding manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Do not install damaged components.

3.03 RAINSCREEN INSTALLATION

- A. Install sidewall sheathing material over framing.
- B. Apply weather barrier in accordance with Section 07 25 00 "Weather Barriers."

- C. Apply trim around windows and doors or shim out other trim 1/4-inch to allow for thickness of rainscreen.
- D. Install rainscreen by butting against window and door trim.
 - 1. Wherever siding or cladding will be applied, roll out rainscreen with channels running vertically. Cover entire wall surface wherever siding materials will be installed.
 - 2. Do not stretch rainscreen.
 - 3. Install rainscreen so that it lies flat against the wall.
 - 4. Butt edges of new rolls or new courses together. Do not overlap layers of rainscreen.
 - 5. Nail or staple rainscreen every 3 square feet.
- E. Install siding or cladding system over wall surface in compliance with manufacturer's installation instructions.
 - 1. Install siding even with trim.
- F. To prevent insect infiltration along bottom edge of siding, attach a 6-inch wide piece of screen material (1/8-inch maximum hole size) continuously along the wall, 3-inches above bottom edge of rainscreen. Fold up onto outer surface of installed rainscreen and fasten with a large head nail to hold in place prior to applying siding or cladding.

3.04 CLAPBOARD AND PANEL SIDING INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Products shall have all butt and scarf joints sealed with a quality, exterior rated, flexible sealant prior to paint application. All non-trim/fascia abutments shall be sealed with the same exterior grade sealant.
- C. Ends exposed due to post-manufacturing field cuts shall be sealed with a premium, 100% acrylic primer, to ensure that no fiber is left to the elements.
- D. Use only corrosion resistant fasteners. Acceptable are stainless steel or hot-dipped galvanized nails; minimum size – 7 penny.
- E. Joints shall fall over framing lumber and shall be double nailed. Siding boards of 10 inches or greater in width require 3 nails evenly spaced across the face of the board. Do not nail any less than 1/2-inch from any edge and fasten a minimum of 24-inches on center.
- F. Drive nails perpendicular to the framing lumber and the wood trim product; drive nails flush with the products surface. Nails shall penetrate at least 1-1/4 inches into the structural framing.

3.05 ADJUSTING AND CLEANING

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

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- B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF WOOD SIDING

SECTION 07 92 00

JOINT SEALANTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Joint Sealants as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Silicone joint sealants.
 - b. Urethane joint sealants.
 - c. Latex joint sealants.
 - d. Solvent-release-curing joint sealants.

1.02 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product specified, including Preparation instructions and recommendations
- B. Samples for Initial Selection: Manufacturer's color charts consisting of cured sealants showing the full range of colors available for each product exposed to view.
- C. Joint Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer and testing agency.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

1.04 QUALITY ASSURANCE

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- A. Product Testing: Test joint sealants using a qualified testing agency.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
 - 2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
- B. Installer Qualifications: Experienced Installer equipped and trained for application of joint sealants required for this Project with record of successful completion of projects of similar scope.

1.05 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

1.06 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.07 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 7 to 10 years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

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1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Provide joint sealant products manufactured by Tremco, Inc., Commercial Sealants and Waterproofing Division, An RPM Company which is located in: Beachwood, OH, or comparable products by Dow Corning Corporation, Sika Corporation, Pecora Corporation, or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 MATERIALS, GENERAL

- A. VOC Content for Interior Applications: Provide sealants and sealant primers complying with the following VOC content limits per 40 CFR 59, Subpart D (EPA Method 24):
 1. Architectural Sealants: 250 g/L.
 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 3. Sealant Primers for Porous Substrates: 775 g/L.
- B. Compatibility: Provide joint sealants and accessory materials that are compatible with one another, and with adjacent materials, as demonstrated by sealant manufacturer using ASTM C 1087 testing and related experience.
- C. Joint Sealant Standard: Comply with ASTM C 920 and other specified requirements for each sealant.
- D. Stain Test Characteristics: Where sealants are required to be non-staining, provide sealants tested per ASTM C 1248 as non-staining on porous joint substrates specified.
- E. Food Contact Suitability: Where sealants are required to be suitable for contact with food provide sealants complying with 21 CFR 177.2600.

2.03 SILICONE JOINT SEALANTS

- A. Single-Component, Non-sag, Non-Staining, Neutral-Curing Silicone Joint Sealant **SJS #1**: ASTM C 920, Type S, Grade NS, Class 100/50, Use NT; SWRI validated.
 1. Basis of Design Product: Spectrem 1 by Tremco
 2. Volatile Organic Compound Content: 1 g/L maximum
 3. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.

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4. Color: As selected by Architect from manufacturer's standard line of colors.
- B. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant **SJS #2**: ASTM C 920, Type S, Grade NS, Class 25, Use NT.
1. Basis of Design Product: Tremsil 200 Sanitary by Tremco
 2. Volatile Organic Compound Content: 1 g/L maximum
 3. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.
 4. Color: As selected by Architect from manufacturer's standard line of colors.

2.04 URETHANE JOINT SEALANTS

- A. Immersible, Multi-Component, Pourable, Traffic Grade Polyurethane Joint Sealant **UJS #1**: ASTM C 920, Type M, Grade P, Class 35, Use T, O, and I.
1. Basis of Design Product: Vulkem 445SSL by Tremco.
 2. Tensile Strength ASTM D412: 250 psi, at 100 percent elongation.
 3. Tear Strength ASTM D412: 35 pli.
 4. Adhesion to Concrete, After Water, ASTM C 794: 28 pli.
 5. Hardness, ASTM C 661: 40 durometer Shore A, minimum.
 6. Accelerated Weathering, ASTM C 793: Pass.
 7. Volatile Organic Compound (VOC) Content: 106 g/L maximum.
 8. Color: As selected by Architect from manufacturer's standard line of colors.

2.05 LATEX JOINT SEALANTS

- A. Latex Joint Sealant **LJS #1**: Siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
1. Basis of Design Product: Tremflex 834 by Tremco
 2. Volatile Organic Compound (VOC) Content: 35 g/L maximum.
 3. Color: As selected by Architect from manufacturer's standard line of colors.

2.06 SOLVENT-RELEASE-CURING JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealant **BJS #1**: ASTM C 1311.
1. Basis of Design Product: Tremco Butyl Sealant
 2. Volatile Organic Compound (VOC) Content: 250 g/L maximum.
 3. Color: As selected by Architect from manufacturer's standard line of colors.

2.07 JOINT SEALANT ACCESSORIES

- A. Cylindrical Sealant Backing: ASTM C 1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane, as recommended by sealant manufacturer for application.
- B. Joint Substrate Primers: Substrate primer recommended by sealant manufacturer for application.
- C. Cleaners: Chemical cleaners acceptable to joint sealant manufacturer.

- D. Masking Tape: Non-Staining, non-absorbent tape product compatible with joint sealants and adjacent surfaces.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine joint profiles and surfaces to determine if work is ready to receive joint sealants. Verify joint dimensions are adequate for development of sealant movement capability. Verify joint surfaces are clean, dry, and adequately cured. Proceed with joint sealant work once conditions meet sealant manufacturer's written recommendations.

3.02 PREPARATION

- A. Joint Surface Cleaning: Clean joints prior to installing joint sealants using materials and methods recommended by sealant manufacturer. Comply with ASTM C 1193.
1. Remove curing compounds, laitance, form-release agents, dust, and other contaminants.
 2. Clean nonporous and porous surfaces utilizing chemical cleaners acceptable to sealant manufacturer.
 3. Protect elements surrounding the Work of this section from damage or disfiguration. Apply masking tape to adjacent surfaces when required to prevent damage to finishes from sealant installation.

3.03 SEALANT APPLICATION

- A. Sealant and Primer Installation Standard: Comply with ASTM C 1193 and manufacturer's written instructions.
- B. Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.
1. Install joint backing to maintain the following joint ratios:
 - a. Joints up to 1/2-inch wide: 1:1 width to depth ratio.
 - b. Joints greater than 1/2-inch wide: 2:1 width to depth ratio; maximum 1/2-inch joint depth.
 2. Install bond breaker tape over substrates when sealant backings are not used.
- C. Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.
- D. Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.
- E. Liquid Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths recommended for application. Apply in continuous operation from

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bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.

1. Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.
2. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
3. Tool exposed joint surface concave using tooling agents provided by sealant manufacturer for application.

F. Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.

1. Remove masking tape immediately after tooling joint without disturbing seal.
2. Remove excess sealant from surfaces while still uncured.

3.04 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer's instructions and with ASTM C 1193, Method A.

1. Perform 5 tests for the first 1000-feet of joint length for each kind of sealant and joint substrate, and one test for each 1000-feet of joint length thereafter or 1 test per each floor per building elevation, minimum.
2. For sealant applied between dissimilar materials, test both sides of joint.

B. Remove sealants failing adhesion test, clean substrates, reapply sealants, and re-test. Test adjacent sealants to failed sealants.

C. Submit report of field adhesion testing to Owner indicating tests, locations, dates, results, and remedial actions taken.

3.05 EXTERIOR JOINT-SEALANT SCHEDULE

- A. Exterior concealed watertight joints in cladding system: **SJS #1**
- B. Exterior joints between different materials: **SJS #1**
- C. Exterior perimeter joints at frames of doors, windows, storefront frames, curtain wall frames, and louvers: **SJS #1**
- D. All other exterior non-traffic joints: **SJS #1**

3.06 INTERIOR JOINT-SEALANT SCHEDULE

- A. Interior sanitary joints between plumbing fixtures, food preparation fixtures, and casework and adjacent walls, floors, and counters: **SJS #2**
- B. Interior traffic joints in floor and between floor and wall construction: **UJS #1**
- C. Interior non-moving joints between interior painted surfaces and adjacent materials: **LJS #1**
- D. Interior concealed sealants at thresholds and sills: **BJS #1**

END OF JOINT SEALANTS

SECTION 08 16 00

COMPOSITE DOORS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Composite Doors as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. FRP doors
 - b. Fiberglass doors
 - c. Fiberglass door frames
- B. Related Work Specified Elsewhere:
 - 1. SECTION 08 71 00: Door Hardware

1.02 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's product data, including description of materials, components, fabrication, finishes, and installation.
- B. Shop Drawings: Submit shop drawings indicating elevations, sections, and details, indicating dimensions, tolerances, materials, fabrication, doors, panels, framing, hardware schedule, and finish.
- C. Submit the following Samples:
 - 1. Door: Submit manufacturer's sample of door showing face sheets, core, framing, and finish.
 - 2. Color: Submit manufacturer's samples of standard colors of doors and frames.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Test Reports: Submit test reports from qualified independent testing agency indicating doors comply with performance requirements.
- B. Maintenance Manual: Submit manufacturer's maintenance and cleaning instructions for doors, including maintenance and operating instructions for hardware.

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- C. Warranty: Submit manufacturer's standard warranty.

1.04 QUALITY ASSURANCE

- A. Manufacturers Qualifications:

1. Continuously engaged in manufacturing doors of similar type to that specified, with a minimum of 25 years successful experience.
2. Door and frame components from same manufacturer.
3. Evidence of a compliant documented quality management system.

1.05 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying opening door mark and manufacturer.
- C. Store materials in clean, dry area indoors in accordance with manufacturer's instructions.
- D. Protect materials and finish from damage during handling and installation.

1.06 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.07 WARRANTY

- A. Warranty doors, frames, and factory hardware against failure in materials and workmanship, including excessive deflection, faulty operation, defects in hardware installation, and deterioration of finish or construction in excess of normal weathering.
- B. Warranty Period: Ten years starting on date of shipment. In addition, a limited lifetime (while the door is in its specified application in its original installation) warranty covering failure of corner joinery, core deterioration, delamination or bubbling of door skin.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Special-Lite, Inc. which is located at: P.O. Box 6, Decatur, MI 49045, or comparable products by CORRIM Company or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 FRP DOORS

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- A. Basis of Design Product: SL-17 Pebble Grain FRP/Aluminum Hybrid Door.
- B. Door Opening Size: As indicated on the Drawings.
- C. Construction:
 - 1. Door Thickness: 1 3/4-inches.
 - 2. Stiles and Rails: Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T6 alloy recovered from industrial processes, minimum of 2-5/16 inch depth.
 - 3. Corners: Mitered.
 - 4. Provide joinery of 3/8-inch diameter full-width tie rods through extruded splines top and bottom integral to standard tubular shaped stiles and rails reinforced to accept hardware as specified.
 - 5. Securing Internal Door Extrusions: 3/16-inch angle blocks and locking hex nuts for joinery. Welds, glue, or other methods are not acceptable.
 - 6. Furnish extruded stiles and rails with integral reglets to accept face sheets. Lock face sheets into place to permit flush appearance.
 - 7. Rail caps or other face sheet capture methods are not acceptable.
 - 8. Extrude top and bottom rail legs for interlocking continuous weather bar.
 - 9. Meeting Stiles: Pile brush weatherseals. Extrude meeting stile to include integral pocket to accept pile brush weatherseals.
 - 10. Bottom of Door: Install bottom weather bar with nylon brush weatherstripping into extruded interlocking edge of bottom rail.
 - 11. Glue: Use of glue to bond sheet to core or extrusions is not acceptable.
- D. Face Sheet:
 - 1. Material: FRP, 0.120-inch thickness, finish color throughout.
 - 2. Protective Coating: Abuse-resistant engineered surface.
 - 3. Texture: Pebble.
 - 4. Color: As selected by Architect from manufacturer's full range.
 - 5. Adhesion: The use of glue to bond face sheet to foam core is prohibited.
- E. Core:
 - 1. Material: Poured-in-place polyurethane foam.
 - 2. Density: Minimum 5 pounds per cubic foot.
 - 3. R-Value: Minimum of 9.
 - 4. ASTM E84: Class A.
- F. Hardware:
 - 1. Pre-machine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
 - 2. Factory install hardware.

2.03 FIBERGLASS DOORS

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- A. Basis of Design Product: AF-100 Smooth Pultruded Fiberglass Door.
- B. Door Opening Size: As indicated on the Drawings.
- C. Construction:
 - 1. Door Thickness: 1 3/4-inches.
 - 2. Construction: Doors shall be FRP, pultruded as one monolithic panel, with integral stiles.
 - 3. Reinforcement: Solid FRP shapes to be chemically welded at factory. All structural members shall utilize a chemically resistant UV stabilized resin system.
 - 4. Stile Edge: Seamless 9/16" thick solid FRP.
 - 5. Top Rail: 6" pultruded tube profile designed to fit flush and be chemically welded inside the door.
 - 6. Bottom Rail: Pultruded FRP inverted U channel designed to fit flush and be chemically welded inside the door, allowing doors to be field trimmed. Closed bottom rail to be supplied as option.
- D. Face Sheet:
 - 1. Material: Pultruded FRP, 0.125-inch thickness, finish color throughout.
 - 2. Texture: Smooth
 - 3. Fiberglass Content: Minimum 47% by weight.
 - 4. Color: As selected by Architect from manufacturer's full range.
- E. Core:
 - 1. Material: Polyurethane foam.
 - 2. Density: Minimum 6 pounds per cubic foot.
 - 3. ASTM E84: Class B.
- F. Cutouts:
 - 1. Manufacture doors with cutouts for required vision lites, louvers, and panels.
 - 2. Factory install vision lites, louvers, and panels.
- G. Hardware:
 - 1. Pre-machine doors in accordance with templates from specified hardware manufacturers and hardware schedule.

2.04 MATERIALS

- A. Aluminum Members:
 - 1. Aluminum extrusions made from prime-equivalent billet that is produced from 100% reprocessed 6063-T6 alloy recovered from industrial processes: ASTM B 221.
 - 2. Sheet and Plate: ASTM B 209

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- 3. Alloy and Temper: As required by manufacturer for strength, corrosion resistance, application of required finish, and control of color.
- B. Components: Door and frame components from same manufacturer.
- C. Fasteners:
 - 1. Material: Aluminum, 18-8 stainless steel, or other noncorrosive metal.
 - 2. Compatibility: Compatible with items to be fastened.
 - 3. Exposed Fasteners: Screws with finish matching items to be fastened.

2.05 FABRICATION

- A. Sizes and Profiles: Required sizes for door and frame units, and profile requirements shall be as indicated on Drawings.
- B. Coordination of Fabrication: Field measure before fabrication and show recorded measurements on shop drawings.
- C. Assembly:
 - 1. Complete cutting, fitting, forming, drilling, and grinding of metal before assembly.
 - 2. Remove burrs from cut edges.
- D. Welding: Welding of doors or frames is not acceptable.
- E. Fit:
 - 1. Maintain continuity of line and accurate relation of planes and angles.
 - 2. Secure attachments and support at mechanical joints with hairline fit at contacting members.

2.06 FIBERGLASS FRAMES

- A. Framing:
 - 1. Size and Type: As indicated on the Drawings.
 - 2. Materials: 1/4" thick solid pultruded FRP profiles having no corrosive components or reinforcement.
 - 3. Width: 2" face.
 - 4. Depth: As required by wall construction.
 - 5. Assembly: Knock down (KD) for field assembly.
 - 6. Doorstop: 5/8" x 2 1/4".
 - 7. Corner Construction: Mitered with 4" x 4" x 3/8" pultruded FRP angle reinforcement with interlocking pultruded FRP brackets.
 - 8. Reinforcing: 1/4" pultruded FRP chemically welded at all hinge, strike, and closer locations.
 - 9. Anchors: As suitable for types of construction.
 - 10. Fasteners for Reinforcing: 18-8 Stainless Steel.

2.07 HARDWARE

- A. Pre-machine doors in accordance with templates from specified hardware manufacturers and hardware schedule.
- B. Factory install hardware.
- C. Hardware Schedule: As specified in Section 08 71 00 "Door Hardware."
- D. Finish: As selected by Architect from manufacturer's full range.

2.08 FIBERGLASS DOOR AND FRAME FINISHES

- A. Finish for Doors and Frames: Primer with a finished color coat.
 - 1. Painted Finish: Two-part aliphatic polyurethane, low VOC, Industrial Coating.
 - 2. Thickness: 5 mils.
 - 3. Sheen: Gloss.
 - 4. Impact Resistance per ASTM D 2794: 140 in lbs.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive doors. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Ensure openings to receive frames are plumb, level, square, and in tolerance.

3.03 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions.
- B. Install doors plumb, level, square, true to line, and without warp or rack.
- C. Anchor frames securely in place.
- D. Separate aluminum from other metal surfaces with bituminous coatings or other means approved by Architect.
- E. Set thresholds in bed of mastic and back seal.
- F. Install exterior doors to be weathertight in closed position.

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- G. Repair minor damages to finish in accordance with manufacturer's instructions and as approved by Architect.
- H. Remove and replace damaged components that cannot be successfully repaired as determined by Architect.

3.04 ADJUSTING

- A. Adjust doors, hinges, and locksets for smooth operation without binding.

3.05 CLEANING

- A. Clean doors promptly after installation in accordance with manufacturer's instructions.
- B. Do not use harsh cleaning materials or methods that would damage finish.

3.06 PROTECTION

- A. Protect installed doors to ensure that, except for normal weathering, doors will be without damage or deterioration at time of substantial completion.

END OF COMPOSITE DOORS

SECTION 08 62 00

UNIT SKYLIGHTS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Unit Skylights as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Self-flashing unit skylights with integral curbs
 - b. Tubular daylighting systems
 - c. Flashing kits
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 07 31 13: Asphalt Shingles

1.02 ACTION SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used:
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for unit skylights.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work.
- C. Submit the following Samples:
 - 1. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

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- B. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of all components.

1.04 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Company specializing in manufacturing products specified in this Section with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in installing products similar to those specified in this Section with minimum five years documented experience.

1.05 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Deliver products in manufacturer's original containers dry, undamaged, with seals and labels intact.
- C. Store products in manufacturer's unopened packaging until ready for installation.

1.06 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.07 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of unit skylights that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Uncontrolled water leakage.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - c. Yellowing of acrylic glazing.
 - d. Breakage of polycarbonate glazing.
 - e. Deterioration of insulating-glass hermetic seal.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, products from VELUX America, LLC, which is located at: 104 Ben Casey Dr., Fort Mill, SC 29708, or comparable products by Wasco Products Inc., or approved equal.

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- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Unit Skylight Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
1. Thermal Transmittance: NFRC 100 maximum U-factor of 0.53.
 2. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum SHGC 0.24.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency and marked for intended location and application.

2.03 UNIT SKYLIGHTS

- A. Description: Factory-assembled, deck mounted, unit consisting of wooden pre-finished interior frame and sash, exterior structurally glazed, roll-formed metal sash and frame cover, production fabricated glazing and anchorage.
- B. System: Fixed
- C. Mounting: Deck mounted, integral curb
- D. Glazing: Dual sealed thermal pane, 95% argon gas, laminated, and with three layers LoE3 silver that increases visible light over standard low E coatings while lowering the solar heat gain.
- E. Condensation Control: Fabricate unit skylights with integral gutters and non-clogging weeps to collect and drain condensation to exterior.
- F. Thermal Break: Fabricate unit skylights with thermal barrier separating exterior and interior metal framing.
- G. Flashing: Manufacturer's standard flashing kit approved for use with roofing materials specified for the Project, and for stacking skylight units' side by side and over and under.
- H. Finishes:
1. Exterior Surfaces: Exposed exterior wood surfaces to be covered with roll formed maintenance free aluminum with Kynar 500 polyvinylidene fluoride resin finish. Color as selected by Architect from manufacturer's full range.
 2. Interior Surface: Pre-finished white.

2.04 TUBULAR DAYLIGHTING SYSTEMS

- A. Description: Tubular unit skylight daylighting kits with exterior glazed opening, glazing retainers and gaskets, exterior flashing assembly with integral adjustable pivot device, reflective tunnel, interior diffuser assemblies, and accessories, as required to meet installation and performance requirements indicated.

- B. System: Pitched with rigid tunnel.
- C. Dome: Transparent, UV-resistant plastic dome.
 - 1. Size: 14-inch diameter.
 - 2. Dome Glazing: 0.25-inch minimum thickness injection molded transparent impact modified acrylic material; with UV-absorbing additive.
- D. Dome Flashing Assembly: Self-flashed.
- E. Reflective Tunnels: Manufacturers standard rigid or flexible reflective tunnel.
- F. Diffusers: Round ceiling diffuser assembly attached directly to bottom of reflective tunnel, with dual high visible light transmittance lenses separated by airtight seals providing insulating airspace, and paintable white acrylic trim ring.
 - 1. Diffuser Accessories: Prismatic Lens.

2.05 ACCESSORY MATERIALS

- A. Fasteners: Same metal as metal being fastened, nonmagnetic stainless steel, or other non-corrosive metal as recommended by manufacturer. Finish exposed fasteners to match material being fastened.
 - 1. Where removal of exterior exposed fasteners might allow access to building, provide non-removable fastener heads.
- B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Coordinate installation of unit skylights with installation of substrates, vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that combined elements are waterproof and weathertight.
- B. Comply with recommendations in AAMA 1607 and with manufacturer's written instructions for installing unit skylights.

- C. Install unit skylights level, plumb, and true to line, without distortion.
- D. Anchor unit skylights securely to supporting substrates.
- E. Where aluminum surfaces of unit skylights will contact another metal or corrosive substrates, such as preservative-treated wood, apply bituminous coating on concealed metal surfaces or provide other approved permanent separation recommended in writing by unit skylight manufacturer.

3.03 **CLEANING**

- A. Clean exposed unit skylight surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes.
- B. Remove excess sealants, glazing materials, dirt, and other substances.
- C. Remove and replace glazing that has been broken, chipped, cracked, abraded, or damaged during construction period.
- D. Protect unit skylight surfaces from contact with contaminating substances resulting from construction operations.

END OF UNIT SKYLIGHTS

SECTION 08 71 00

DOOR HARDWARE

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Door Hardware as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Mechanical door hardware
 - b. Templating required by other Sections
- B. Related Work Specified Elsewhere:
 - 1. SECTION 08 16 00: Composite Doors

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication, and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Submittal Sequence: Submit door hardware schedule concurrent with submission of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
 - 2. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.
 - 3. Content: Include the following information:
 - a. Identification number, location, hand, fire rating, size, and material of each door and frame.
 - b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
 - c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish for each door hardware product.
 - d. Fastenings and other pertinent information.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. List of related door devices specified in other Sections for each door and frame.

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- C. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and Architectural Hardware Consultant.
- B. Product Test Reports: For Compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.
- C. Warranty: Special warranty specified in this Section.

1.04 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware schedule.

1.05 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.
- B. Maintenance Tool and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, removal, and replacement of door hardware.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
- B. Architectural Hardware Consultant Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI.
- C. Source Limitations: Obtain each type of door hardware from a single manufacturer.
- D. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.
- E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

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1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:
 - a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2-inch high.
4. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from latch, measured to the leading edge of the door.

1.07 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
- C. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

1.08 COORDINATION

- A. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.09 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures including excessive deflection, cracking, or breakage.
 - b. Faulty operation of doors and door hardware.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 2. Warranty Period: Ten years from date of Substantial Completion, unless otherwise indicated.
 - a. Exit Devices: Five years from date of Substantial Completion.
 - b. Manual Closers: Ten years from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

- A. Provide door hardware for each door as scheduled on Drawings to comply with requirements in this Section.
 - 1. Door Hardware Sets: Provide quantity, item, size, finish, or color indicated, and named manufacturer's products, unless otherwise noted.
- B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 2 Articles following. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Manufacturer and product designations are listed for each door hardware type required for the purpose of establishing minimum requirements.

2.02 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products from Hager Companies which is located at: 139 Victor St., St. Louis, MO 63104, or comparable products by other manufacturers listed below.
- B. The following manufacturers are approved subject to compliance with requirements, for the product categories listed:
 - 1. Hinges: Hager, Stanley
 - 2. Locks and Latches: Schlage, Sargent
 - 3. Deadbolts: Schlage, Sargent
 - 4. Cylinders: Schlage, Sargent
 - 5. Push/Pull Plates and Bars: Hager, Rockwood, Ives, Burns
 - 6. Closers: LCN, Sargent
 - 7. Protective Trim: Hager, Rockwood, Burns
 - 8. Stops and Holders: Hager, Rockwood
 - 9. Gasketing and Weatherstripping: Hager, National Guard
 - 10. Thresholds: Hager, National Guard
 - 11. Silencers: Hager, Ives, Rockwood, Burns

2.03 HINGES

- A. Hinges:
 - 1. Butts and Hinges: ANSI/BHMA A156.1
 - 2. Template Hinge Dimensions: ANSI/BHMA A156.7
 - 3. Self-Closing Hinges: ANSI/BHMA A156.17
- B. Butt Hinges:
 - 1. Hinge weight and size unless otherwise indicated in hardware sets:

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- a. Doors from 36-inches wide up to 42-inches wide and up to 1-3/4 inches thick provide heavy weight-ball bearing hinges a minimum of 4-1/2 inches in height.
 - b. Doors greater than 36-inches wide and over 1-3/4 inches thick provide heavy weight-ball bearing hinges a minimum of 5-inches in height.
 - c. Width of hinge is to be minimum required to clear surrounding trim.
2. Base material unless otherwise indicated in hardware sets:
 - a. All Doors: 304 Stainless Steel.
 - b. Stainless Steel ball bearing hinges shall have stainless steel ball bearings. Steel ball bearings are unacceptable.
3. Quantity of hinges per door unless otherwise stated in hardware sets:
 - a. Doors up to 60-inches in height provide 2 hinges.
 - b. Doors 60-inches up to 90-inches in height provide 3 hinges.
 - c. Doors 90-inches up to 120-inches in height provide 4 hinges.
 - d. Doors over 120-inches in height add 1 additional hinge per each additional 30-inches in height.
 - e. Dutch doors provide 4 hinges.
4. Hinge design and options unless otherwise indicated in hardware sets:
 - a. Hinges are to be of a square corner five-knuckle design, flat button tips and have ball bearings unless otherwise indicated in hardware sets.
 - b. Out-swinging exterior and out-swinging access controlled doors shall have non-removable pins (NRP) to prevent removal of pin while door is in closed position.
5. Basis of Design Products: Hager BB1199 heavy weight, or Stanley FBB199 heavy weight.

2.04 LOCKS AND LATCHES (CYLINDRICAL)

- A. Locks and Latches: ANSI/BHMA A156.2 Series 4000 Certified to Grade 1.
- B. Lock and latch function numbers and descriptions of manufacturer's series as listed in hardware sets. Material and Design:
 1. Lock and Latch chassis to be Zinc dichromate for corrosion resistance.
 2. Keyed functions to be of a freewheeling design to help resist against vandalism.
 3. Non-handed, field reversible.
 4. Thru-bolt mounting with no exposed screws.
 5. Levers shall be Zinc cast and plated to match finish designation in hardware sets.
 6. Roses shall be of solid Brass or Stainless Steel material.
- C. Latch and Strike:
 1. Stainless Steel latch bolt with minimum of 1/2-inch throw and deadlocking for keyed and exterior functions. Provide 3/4-inch latch bolt for pairs of fire rated doors where required by door manufacture. Standard backset to be 2-3/4 inches and faceplate shall be adjustable to accommodate a square edge door or a standard 1/8-inch beveled edge door.
 2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4 inches by 4-7/8 inches with proper lip length to protect surrounding trim.

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- D. Basis of Design Products: Schlage ND Series, or Sargent 10X Line. Lever style as selected by Architect.

2.05 LOCKS AND LATCHES (MORTISE)

- A. Locks and Latches (Mortise): ANSI/BHMA A156.13 Series 1000 Certified to Grade 1 for Operational and Security.
- B. Lock and latch function numbers and descriptions of manufacturer's series as listed in hardware sets. Material and Design:
1. Lock cases from fully wrapped, 12 gauge steel, Zinc dichromate for corrosion resistance.
 2. Non-handed, field reversible without opening lock case.
 3. Break away spindles to prevent unlocking during forced entry or vandalism.
 4. Levers are to be Zinc cast, Forged Brass or Stainless Steel and plated to match finish designation in hardware sets.
 5. Sectional Roses are to be of solid Brass or Stainless Steel material and have a minimum diameter of 2-7/16 inches.
 6. Escutcheons are to be of solid Brass or Stainless Steel material.
 7. Armor fronts are to be self-adjusting to accommodate a square edge door or a standard 1/8-inch beveled door edge.
- C. Latch and Strike:
1. Stainless Steel latch bolt with minimum of 3/4-inch throw and deadlocking for keyed and exterior functions.
 2. Strike is to fit a standard ANSI A115 prep measuring 1-1/4 inches by 4-7/8 inches with proper lip length to protect surrounding trim.
 3. Deadbolts to be 1-3/4 inches total length with a minimum of a 1-inch throw and 3/4-inch internal engagement when fully extended and made of Stainless Steel material.
- D. Basis of Design Products: Schlage L Series (Escutcheon Trim), or Sargent 8200 Series (Escutcheon Trim). Lever style as selected by Architect.

2.06 DEADBOLTS

- A. Deadbolts: ANSI/BHMA A156.5 Grade 1.
- B. Deadbolt function numbers and descriptions of manufacturer's series as listed in hardware sets. Material and Design:
1. Latch bolt: 1-inch throw; Material: brass with concealed hardened steel roller to prevent sawing or cutting.
 2. Freewheeling collar design to help resist against vandalism.
 3. Non-handed, field reversible.
- C. Basis of Design Products: Schlage B Series, or Sargent 480 Series.

2.07 MORTISE DEADBOLTS

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- A. Mortise Deadbolts: ANSI/BHMA A156.13 Series 2000 Grade 1 Operational and Security.
- B. Deadbolt function numbers and descriptions of manufacturer's series as listed in hardware sets. Material and Design:
 - 1. Latch bolt projection 1-inch throw.
 - 2. Case steel, zinc dichromate.
 - 3. Armor front 5-9/16 inches, case dimension 4-5/16 inches by 3-9/16 inches by 1-inch.
- C. Basis of Design Products: Sargent 8200 Series.

2.08 CYLINDERS AND KEYING

- A. Cylinders: ANSI A156.5, Grade 1, 7-pin type removable cylinders. Small Format Interchangeable Cores (SFIC). Match existing building cylinders.
 - 1. Shall be furnished with cams/tailpieces as required for locking device that is being furnished for project.
- B. Keying: Key to existing keying system.
 - 1. Include construction keying.
 - 2. Keys: Nickel silver. Stamp keys with "DO NOT DUPLICATE".
 - 3. Supply keys in the following minimum quantities:
 - a. 2 change keys for each lock.
 - b. 3 control keys and 10 extra cylinder cores.
 - c. 3 construction keys
- C. Basis of Design Product: Hager 3900 Series, Schlage IC Cylinders, or Sargent 7300B Series.

2.09 PUSH/PULL PLATES AND BARS

- A. Push and Pull Plates: ANSI/BHMA A156.6, stainless steel unless otherwise indicated.
- B. On solid doors, provide matching push plate and pull plate on opposite faces.
- C. Basis of Design Products: Hager 30S push plate and 33J pull plate, Rockwood 70 push plate and RM301 pull, Ives 8300 push plate and 8103EZ pull plate, or Burns 50 Series push plate and 5025A pull plate.

2.10 CLOSERS

- A. Closers: BHMA Certified ANSI A156.4 Grade 1; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm.
- B. Mounting:

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1. Out swing doors shall have surface parallel arm mount closers except where noted on hardware schedule.
2. In swing doors shall have surface regular arm mount closers except where noted on hardware schedule.
3. Provide brackets and shoe supports for aluminum doors and frames to mount fifth screw.
4. Furnish drop plates where top rail conditions on door do not allow for mounting of closer and where backside of closer is exposed through glass.

C. Basis of Design Products: LCN 4030 Series, or Sargent 351 Series.

2.11 PROTECTIVE TRIM

A. Protective Trim: ANSI/BHMA A156.6; fabricated from minimum 0.050-inch thick stainless steel.

B. Size of Protection Plate:

1. Single doors, size 2-inches less door width on push side of door and 1-inch less on pull side of door.
2. Kick plates 10-inches high or sized to door bottom rail height. Mop Plates 4-inches high. Armor Plates 36-inches high.

C. Material and Design:

1. Corners shall be square. Polishing lines or dominant direction of surface pattern shall run across the door width of plate.
2. Bevel top, bottom and sides uniformly leaving no sharp edges. Edges shall be deburred.
3. Countersink holes for screws. Screw holes shall be spaced equidistant 8-inches center to center, along a centerline not over 1/2-inch in from edge around plate. End screws shall be a maximum of 0.53-inch from corners.

D. Basis of Design Products: Hager 194S, Rockwood K1050 Series, or Burns KP50 Series.

2.12 STOPS AND HOLDERS

A. Wall Stops: ANSI/BHMA A156.16; Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall stops when possible. Door stops and holders mounted on concrete floor or masonry walls shall have stainless steel machine screws and lead expansion shields.

B. Basis of Design Product: Hager 255S, 256S (holder), or Rockwood 475, 476 (holder)

2.13 DOOR GASKETING AND WEATHERSTRIP

A. Door Gasketing and Edge Seal Systems: ANSI/BHMA A156.22; air leakage not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

B. Basis of Design Products:

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1. Weather Stripping: Hager 881S, or National Guard Products 700EN.
2. Door Bottom Sweeps: Hager 750S, National Guard Products 200NA, or Pemko 315_N.

2.14 THRESHOLDS

- A. Thresholds: ANSI/BHMA A156.21; fabricated to full width of opening and full depth of frame.
- B. Basis of Design Products:
 1. Saddle Threshold: Hager 413S, or National Guard Products 1/4-inch high Flat Saddle.
 2. Thermal Break Saddle Threshold: Hager 421S, or National Guard Products 842 Series.

2.15 SILENCERS

- A. Silencers: ANSI/BHMA A156.16; Where smoke, light, or weather seals are not required, provide three silencers per single door frame, two per double door frame and four per dutch door frame.

2.16 FABRICATION

- A. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.
- B. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
 1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
 2. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.17 FINISHES

- A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
- 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.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine doors and frames, with installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- B. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30-inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.
- D. Lock Cylinders: Install construction cores to secure building and areas during construction period. Provide and install permanent cores and keying at Substantial Completion and test for smooth operation.
- E. Thresholds: Set thresholds for exterior doors and other doors indicated in a full bed of sealant complying with requirements specified in Section 07 92 00 "Joint Sealants."
- F. Stops: Provide wall stops for doors unless other stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

- G. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- H. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.04 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.
- D. Leave manufacturer's protective film intact and provide proper protection for all other finish hardware items that do not have protective material from manufacturer until Architect accepts Project as complete.

3.05 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes.

3.06 HARDWARE SET SCHEDULE

- A. Guide: Door hardware items have been placed in sets which are intended to be a guide of design, grade, quality, function, operation, performance, exposure, and like characteristics of door hardware, and may not be complete. Provide door hardware required to make each set complete and operational.
- B. Hardware schedule does not reflect handing, backset, method of fastening and like characteristics of door hardware and door operation.
- C. Review door hardware sets with door types, frames, sizes, and details on drawings. Verify suitability and adaptability of items specified in relation to details and surrounding conditions.

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- D. The following hardware sets list items of finish hardware required for each opening. The quantities of each type are the responsibility of the finish hardware supplier.

SET #1: Finish US26D

Locations: Janitors Closet

<u>Qty.</u>	<u>Item</u>	<u>Description</u>
3	Hinges	As specified
1	Cylindrical Lockset	Storeroom function (F07)
1	Protective Trim	Kick Plate
1	Door Stop	Wall mounted with holder
1	Perimeter Gasketing	As specified
1	Door Sweep	As specified
1	Threshold	As specified

SET #2: Finish US26D

Locations: Existing Toilet Room Doors

<u>Qty.</u>	<u>Item</u>	<u>Description</u>
3	Hinges	Existing to remain
1	Deadbolt Lockset	Cylinder x Thumbturn (E2151)
1	Push/Pull Plates and Bars	As specified
1	Door Stop	Wall mounted with holder
1	Perimeter Gasketing	As specified
1	Door Sweep	As specified
1	Threshold	As specified

Notes: During operating hours solid doors are unlocked and held open with a holder. Screen doors operate with push/pull hardware and a closer. During cleaning and maintenance, staff can lock door from the interior with a thumbturn to prevent public from entering. Door always lockable from exterior to prevent public entry.

SET #3: Finish US26D

Locations: Shower Rooms

<u>Qty.</u>	<u>Item</u>	<u>Description</u>
3	Hinges	As specified
1	Deadbolt Lockset	Cylinder x Blank Rose
1	Mortise Lockset	Privacy function with Indicator (F22)
1	Closer	As specified
1	Protective Trim	Kick Plate
1	Door Stop	Wall mounted
1	Perimeter Gasketing	As specified
1	Door Sweep	As specified
1	Threshold	As specified

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Notes: Door unlocked when not occupied and locked by thumbturn inside when in use. Turning thumbturn or closing door unlocks outside lever. Indicator to have green and red markings with "Vacant/Occupied" wording. Door always lockable from exterior to prevent public entry.

END OF DOOR HARDWARE

SECTION 09 29 00

GYPSUM BOARD

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Gypsum Board as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Gypsum board
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 09 91 00: Painting

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.04 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements, or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels 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, and irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 – PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Moisture and Mold-Resistant Assemblies: Provide and install moisture and mold-resistant glass-mat gypsum board products with moisture-resistant surfaces complying with ASTM C 1658 and ASTM C 1177 where indicated on Drawings and in all locations which might be subject to moisture exposure during construction.

2.02 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products from Georgia-Pacific Gypsum or comparable products by National Gypsum, USG Corporation or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.03 GYP SUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.04 INTERIOR GYP SUM BOARD

- A. Gypsum Wallboard (GWB): ASTM C 1396/C 1396 M.
 - 1. Basis of Design Product: ToughRock Gypsum Board.
 - 2. Thickness: As indicated on the Drawings
 - 3. Long Edges: Tapered
- B. Gypsum Ceiling Board: ASTM C 1396/C 1396 M.
 - 1. Basis of Design Product: DensArmor Plus High-Performance Interior Panel
 - 2. Thickness: As indicated on Drawings.
 - 3. Long Edges: Tapered.
- C. Moisture and Mold-Resistant Gypsum Board (M.R. GWB): ASTM C 1396/C 1396M. With moisture and mold resistant core and paper surfaces.
 - 1. Basis of Design Product: DensArmor Plus High-Performance Interior Panel.
 - 2. Core: As indicated.
 - 3. Long Edges: Tapered.
 - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- D. Glass-Mat Gypsum Sheathing Board (G.M. GWB): ASTM C 1177/C 1177M, with fiberglass mat laminated to both sides and with manufacturer's standard edges.
 - 1. Basis of Design Product: DensGlass Sheathing.
 - 2. Core: As indicated.

2.05 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047
 - 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 - 2. Shapes: As required and as noted on Drawings.

2.06 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 - 1. Interior Gypsum Board: Paper.
 - 2. Glass-Mat Gypsum Wallboard: 10-by-10 fiberglass mesh.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 - 1. Prefilling: At open joints, rounded or 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 drying-type, all-purpose compound.

2.07 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. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112-inch thick.
 - 2. For fastening cementitious backer units, use screw of type and size recommended by panel manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, 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.

3.02 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16-inch or open space between panels. Do not force into place.
- D. 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.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Isolate perimeter of gypsum board applied to non-load bearing partitions at structural abutments, except floors. Provide 1/4 to 1/2-inch wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- G. Wood Framing: Install gypsum panels over wood framing, with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide dimension lumber, including floor joists and headers. Float gypsum panels over these members or provide control joints to counteract wood shrinkage.

3.03 APPLYING INTERIOR GYPSUM BOARD

- A. Single-Layer Application:
 - 1. Ceilings: Apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 - 2. Partitions and Walls: Apply gypsum panels horizontally (perpendicular 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 panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire resistance rated assembly.
 - 3. Furring Members: Apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.

3.04 INSTALLING TRIM ACCESSORIES

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- 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.

3.05 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, 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, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 3: Where indicated on Drawings.
 - 4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
- E. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.06 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 GYPSUM BOARD

SECTION 09 67 23

RESINOUS FLOORING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Resinous Flooring as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Resinous flooring systems
 - b. Integral resinous base
- B. Related Work Specified Elsewhere:
 - 1. SECTION 03 30 00: Cast-In-Place Concrete
 - 2. SECTION 06 10 00: Rough Carpentry

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. Samples for Initial Selection: For each type of exposed finish required.
- C. Product Schedule: For resinous flooring.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- B. Material Certificates: For each resinous flooring component, from manufacturer.
- C. Material Test Reports: For each resinous flooring system.

1.04 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of flooring systems required for this Project.
 - 1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.07 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close space to traffic during resinous flooring application and for not less than 24 hours after application unless manufacturer recommends a longer period.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products from Dur-A-Flex, Inc. which is located at: 95 Goodwin Street, East Hartford, CT 06108, or comparable products by Key Resin Company, Laticrete, Sherwin Williams, or approved equal.
- B. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.

2.02 RESINOUS FLOORING

- A. Resinous Flooring: Abrasion-, impact-, and chemical-resistant, aggregate- or pigment-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.
- B. System Characteristics:
 - 1. Color and Pattern: As selected by Architect from manufacturer's full range].
 - 2. Wearing Surface: Textured for slip resistance.
 - 3. Overall System Thickness: 3/16 inch.

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- C. Primer: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.
 - 1. Formulation Description: High solids.
- D. Waterproofing Membrane: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.
 - 1. Formulation Description: High solids.
- E. Reinforcing Membrane: Flexible resin formulation that is recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated and that inhibits substrate cracks from reflecting through resinous flooring.
 - 1. Formulation: High solids.
 - a. Provide fiberglass scrim embedded in reinforcing membrane.
- F. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
- G. Body Coats:
 - 1. Resin: Epoxy.
 - 2. Formulation Description: 100 percent solids.
 - 3. Type: Pigmented.
 - 4. Number of Coats: One
 - 5. Thickness of Coats: 1/16 inch.
 - 6. Aggregates: Colored quartz.
- H. Grout Coat:
 - 1. Resin: Epoxy.
 - 2. Formulation Description: 100 percent solids.
 - 3. Type: Clear.
 - 4. Thickness of Coats: 1/16 inch.
- I. Top Coats: Sealing or finished coats
 - 1. Resin: Urethane.
 - 2. Formulation Description: High solids.
 - 3. Type: Clear.
 - 4. Number of Coats: One.
 - 5. Thickness of Coats: 1/16 inch.
 - 6. Finish: Matte.
 - 7. Aggregate: Traction additive as needed for increased traction.
- J. System Physical Properties: Provide resinous flooring system with the following minimum physical requirements when tested according to test methods indicated:

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1. Bond Strength to Concrete: 400 psi substrate fails per ASTM D 4541.
2. Tensile Strength: 4,000-5,000 per ASTM D 638.
3. Impact Direct/Reverse: >160 in-lb per ASTM D 2794.
4. Abrasion Resistance: 22-28 maximum weight loss per ASTM D 4060.
5. Flammability: Self-extinguishing per ASTM D 635.
6. Hardness: 75-80, Shore D per ASTM D 2240.
7. Full Chemical Resistance: 7 days.

PART 3 – EXECUTION

3.01 PREPARATION

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
 1. Roughen concrete substrates as follows:
 - a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within apparatus, and recirculates the shot by vacuum pickup.
 2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
 3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
 - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb. of water/1000 sq. ft. of slab area in 24 hours.
 - b. Plastic Sheet Test: ASTM D 4263. Proceed with application only after testing indicates absence of moisture in substrates.
 - c. Relative Humidity Test: Use in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
 4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
 1. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.
- D. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

3.02 APPLICATION

- A. Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
 - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing process.
 - 3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.
- B. Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Waterproofing Membrane: Apply waterproofing membrane, over entire substrate surface, in manufacturer's recommended thickness.
 - 1. Apply waterproofing membrane to integral cove base substrates.
- D. Reinforcing Membrane: Apply reinforcing membrane to substrate cracks.
- E. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.
 - 1. Integral Cove Base: 6-inches high.
- F. Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness indicated for flooring system.
 - 1. Aggregates: Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.
- G. Troweled or Screeded Body Coats: Apply troweled or screeded body coats in thickness indicated for flooring system. Hand or power trowel and grout to fill voids. When body coats are cured, remove trowel marks and roughness using method recommended by manufacturer.
- H. Grout Coat: Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat and to produce wearing surface indicated.
- I. Topcoats: Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer and to produce wearing surface indicated.

3.03 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF RESINOUS FLOORING

SECTION 09 91 00

PAINTING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Painting as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
 - a. Painting and finishing of all interior and exterior exposed items and surfaces, and any other surfaces indicated on the Drawings or herein specified to receive paint.
NOTE: Special attention shall be given to the proper priming of all sides and edges of all exterior wood to be painted.
 - b. All necessary surface preparation and priming.
 - c. Field testing compatibility of new paint with existing paint or finishes to be covered.
 2. The painting subcontractor shall fully examine all Drawings and Specification Sections to determine scope of their provisions regarding painting and finishing. All surfaces that are primed or left unfinished by the requirements of other Sections of the Specifications shall be painted or finished as a part of this Section.
 3. The painting subcontractor shall examine the Drawings and note new patches in existing construction. In cases where new finishes are not scheduled for the existing construction, new patches shall be finished to match existing.
- B. The following categories of work are not included as part of field-applied painting and finishing Work.
1. Prefinished Items: Unless otherwise indicated, painting is not required on items specified for factory- or installer-finishing.
 2. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces in concealed areas and generally inaccessible areas, foundation spaces, furred areas, attics, utility tunnels and pipe spaces, and elevator and duct shafts.
 3. Finished Metal Surfaces: Unless otherwise indicated, painting is not required on metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze, and similar finished materials.
 4. Operating Parts: Painting is not required on moving parts of operating units, mechanical and electrical parts such as valve and damper operators, linkages, sensing devices, and motor and fan shafts.
- C. Do not paint over any code-required labels, such as Underwriters' Laboratories (UL) and Factory Mutual (FM), or any equipment identification, performance rating, name, or nomenclature plates.

1.02 DEFINITIONS

- A. Definitions of Painting Terms: In accordance with ASTM D 16, unless otherwise specified.

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- B. Dry Film Thickness (DFT): Thickness of a coat of paint in fully cured state measured in mils (1/1000 inch).
- C. Paints are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 and/or 85 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe the gloss of the products specified. The list below is provided for general guidance; refer to the technical data sheet for the actual gloss/sheen level for each product.
 - 1. Flat: Less than 5 Percent.
 - 2. Eggshell: 5 – 20 Percent.
 - 3. Satin: 20 – 35 Percent.
 - 4. Semi-Gloss: 30 – 65 Percent.
 - 5. Gloss: Over 65 Percent.

1.03 ACTION SUBMITTALS

- A. Product Data: Provide a complete list of all products to be used, with the following information for each.
 - 1. Manufacturer's name, product name and/or catalog number, and general product category.
 - 2. Cross-reference to specified paint system(s) that the product is to be used in; include description of each system.
- B. Samples for Initial Selection: For each product specified, color chips indicating manufacturers full range of available colors and sheens.
- C. Samples for Verification: Paper samples, 5 inches by 7 inches in size, illustrating selected colors for each color and system selected with specified coats cascaded.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.04 INFORMATIONAL SUBMITTALS

- A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years' experience.
- B. Installer Qualifications: All products listed in this section are to be applied by a Painting Contractor with a minimum of five years demonstrated experience in surface preparation and field application of the same type and scope as specified.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

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- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Store materials in an area that is within the acceptable temperature range per manufacturer's instructions. Protect from freezing.

1.06 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not apply paint in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.07 EXTRA MATERIALS

- A. At project closeout, supply the Owner or owner's representative one gallon of each product for touch-up purposes. Cans shall be clearly marked with color name, number, and type of paint.
- B. At project closeout, provide the color mixture name and code to the Owner or owner's representative for accurate future color matching.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide Sherwin-Williams Company products indicated or comparable product from one of the following:
 - 1. Duron, Inc.
 - 2. Benjamin Moore & Company
 - 3. Pratt & Lambert
 - 4. PPG Pittsburg Paints
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 MATERIALS, GENERAL

- A. Paints and Coatings:
 - 1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturers product instructions.
 - 2. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color. Or follow manufacturers product instructions for optimal color conformance.

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- B. Compatibility: Provide materials for use within each paint system that are compatible with one another, and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Colors: As selected by the Architect from manufacturer's full range.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared; notify Architect of unsatisfactory conditions before proceeding. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- B. Ensure that moisture-retaining substrates to receive paint have moisture content within tolerances allowed by coating manufacturer.
- C. Examine surfaces to receive coatings for surface imperfections and contaminants that could impair performance or appearance of coatings, including but not limited to, loose primer, rust, scale, oil, grease, mildew, algae, or fungus, stains or marks, cracks, indentations, or abrasions.
- D. Correct conditions that could impair performance or appearance of coatings in accordance with specified surface preparation procedures before proceeding with coating application.

3.02 SURFACE PREPARATION

- A. General: Perform preparation and cleaning procedures in accordance with paint manufacturer's instructions and as herein specified, for each particular substrate condition.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Cleaning: Before applying paint or surface treatments, clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint system indicated.
- D. Existing Coatings:
 - 1. Remove surface irregularities by scraping or sanding to produce uniform substrate for coating application; apply one coat primer of type recommended by coating manufacturer for maximum coating adhesion.

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2. If presence of lead in existing coatings is suspected, cease surface preparation, and notify Architect immediately.
- E. Wood:
1. Seal knots, pitch streaks, and sap areas with sealer recommended by coating manufacturer, fill nail recesses and cracks with filler recommended by coating manufacturer; sand surfaces smooth.
 2. Remove mill marks and ink stamped grade marks.
 3. Prime edges, ends, faces, undersides, and backsides of wood.
 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.03 APPLICATION

- A. Apply each coat to a uniform coating thickness in accordance with manufacturer's instructions, not exceeding manufacturer's specified maximum spread rate for indicated surface; thins, brush marks, roller marks, orange-peel, or other application imperfections are not permitted.
- B. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying next coat.
- C. Inspect each coat before applying next coat; touch-up surface imperfections with coating material, feathering, and sanding if required; touch-up areas to achieve flat, uniform surface without surface defects visible from 5-feet.
- D. Remove dust and other foreign materials from substrate immediately prior to applying each coat.
- E. Where paint application abuts other materials or other coating color, terminate coating with a clean sharp termination line without coating overlap.
- F. Where color changes occur between adjoining spaces through framed openings that are of the same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.
- G. Re-prepare and re-coat unsatisfactory finishes; refinish entire area to corners or other natural terminations.
- H. Interior wood trim to be painted shall be back-primed before installation with an interior wood primer.
- I. Exterior wood trim to be painted shall be back-primed before installation with exterior wood primer. Edges of exterior plywood shall be similarly primed before installation.
- J. Painting Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 1. Paint the following work where exposed in equipment rooms and exterior conditions:
 - a. Uninsulated metal and plastic piping.

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- b. Pipe hangers and supports.
 - c. Metal and plastic conduit.
 - d. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
2. Paint the following work where exposed in occupied spaces and corridors:
 - a. Equipment, including panelboards.
 - b. Uninsulated metal and plastic piping.
 - c. Pipe hangers and supports.
 - d. Metal and plastic conduit.
 - e. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - f. Other items as directed by Architect.
3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.04 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced surfaces.

3.05 PAINTING AND COATING SCHEDULE

A. Exterior Painting:

1. Ferrous Metal, Galvanized Metal and Aluminum:
 - Prime Coat: Primer, water-based, anti-corrosive for metal: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series, 5.0 to 10.0 mils wet, 2.0 to 4.0 mils dry.
 - Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
 - Topcoat: Light industrial coating, exterior, water based, gloss: S-W Pro Industrial Acrylic Gloss Coating, B66-600 Series, at 2.5 to 4.0 mils dry, per coat.
2. Wood:
 - Prime Coat: Primer, latex for exterior wood.
 - Intermediate Coat: Latex, exterior, matching topcoat.

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- Topcoat: Latex, exterior satin: S-W A-100 Exterior Latex Satin, A82 Series, at 4.0 mils wet, 1.5 mils dry, per coat.
- Topcoat (Trim): Latex, exterior, gloss: S-W A-100 Exterior Latex Gloss, A8 Series, at 4.0 mils wet, 1.3 mils dry, per coat.

B. Interior Painting:

1. Gypsum Board:

a. Walls (Toilet rooms, showers, kitchens, and mechanical spaces):

- Prime Coat: Primer sealer, latex, interior: S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.5 mils dry
- Intermediate Coat: Light industrial coating, interior, water based, matching topcoat
- Topcoat: Light industrial coating, interior, water based, eggshell: S-W Pro Industrial Pre-Catalyzed Waterbased Epoxy, K45-151 Series, at 4.0 mils wet, 1.5 mils dry, per coat

b. Ceilings

- Prime Coat: Primer, latex, interior: S-W ProMar 200 Zero VOC Latex Primer, B28W2600, at 4.0 mils wet, 1.5 mils dry
- Intermediate Coat: Latex, interior, matching topcoat
- Topcoat: Latex, interior, flat: S-W ProMar 200 Zero VOC Latex Flat, B30-2600 Series, at 4.0 mils wet, 1.6 mils dry, per coat

2. Disturbed Work: Disturbed work both interior and exterior caused by construction shall be thoroughly cleaned, repaired, and sanded, and given sufficient coats of paint of color to match adjacent work so that the finished work will blend satisfactorily with existing work as approved by the Owner. Test patches shall be made to demonstrate compatibility of new paint materials with existing surfaces.

END OF PAINTING

SECTION 09 93 00

STAINING AND TRANSPARENT FINISHING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Staining and Transparent Finishing as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Interior and exterior stains and clear finishes.
 - b. All necessary surface preparation
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 20 00: Finish Carpentry
 - 2. SECTION 07 46 23: Wood Siding

1.02 DEFINITIONS

- A. Stains are available in a wide range of opacities from transparent stain that allow all the grain and texture to show to solid colors which mask all the grain but allow the texture to show. The following terms are used to describe the different opacities.
 - 1. Transparent
 - 2. Semi Transparent
 - 3. Semi Solid
 - 4. Solid Color
- B. Varnishes and clear coats are available in a wide range of sheens or glosses, as measured by a gloss meter from a 60 degree angle from vertical, as a percentage of the amount of light that is reflected. The following terms are used to describe gloss levels.
 - 1. Flat: 10 – 20 percent
 - 2. Satin / Low Lustre: 20 – 35 percent
 - 3. Semi-Gloss: 35 – 70 percent
 - 4. Gloss: Over 70 percent

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: For each type of product indicated.

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- C. Samples for Verification: For each type of finish system and in each color and gloss of finish indicated.
 - 1. Submit Samples on representative samples of actual wood substrates, 8-inches square or 8-inches long.
 - 2. Label each Sample for location and application area.
- D. Product List: For each product indicated, include the following:
 - 1. Cross-reference to finish system and locations of application areas. Use same designations indicated on Drawings and in Schedules.
- E. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.04 MAINTENANCE MATERIAL SUBMITTAL

- 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. Stains and Transparent Finishes: 5 percent, but not less than 1 gallon of each material and color applied.

1.05 QUALITY ASSURANCE

- A. Manufacturers Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years' experience.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum five years demonstrated experience in installing products of the same type and scope as specified.

1.06 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 degrees F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.07 PROJECT CONDITIONS

- A. Apply finishes only when temperatures of surfaces to be finished and ambient air temperatures are between 50 and 95 degrees F.

- B. Do not apply finishes when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.
- C. Do not apply exterior finishes in snow, rain, fog, or mist.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products from one of the following:
 - 1. Benjamin Moore & Co.
 - 2. Cabot
 - 3. Minwax
 - 4. PPG Architectural Coatings
 - 5. Sherwin-Williams Company (The)
- B. Products: Subject to compliance with requirements, provide product listed in wood finish systems schedule, or approved equal, for the product category indicated.

2.02 MATERIALS, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each finish system that are compatible with one another, and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a finish system, provide products recommended in writing by manufacturers of topcoat for use in finish system and on substrate indicated.
- B. Stain Colors: As selected by Architect from manufacturer's full range.

2.03 MIXING AND TINTING

- A. Except where specifically noted in this Section, all stain shall be ready-mixed and pre-tinted. Agitate all stain prior to and during application to ensure uniform color, gloss, and consistency.
- B. Thinner addition shall not exceed manufacturer's printed recommendations. Do not use kerosene or other organic solvents to thin water-based paints.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

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- B. Maximum Moisture Content of Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with finish application only after unsatisfactory conditions have been corrected.
 - 1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.02 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 - 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
- D. Exterior Wood Substrates:
 - 1. Scrape and clean knots and apply coat of knot sealer before applying primer.
 - 2. Prime edges, ends, faces, undersides, and backsides of wood.
 - a. For solid hide stained wood, stain edges and ends after priming.
 - b. For varnish coated stained wood, stain edges and ends and prime with varnish. Prime undersides and backsides with varnish.
 - 3. Countersink steel nails, if used, and fill with putty or plastic wood filler tinted to final color. Sand smooth when dried.
- E. Interior Wood Substrates:
 - 1. Scrape and clean knots and apply coat of knot sealer before applying primer.
 - 2. Apply wood filler paste to open-grain woods, as defined in "MPI Architectural Painting Specification Manual," to produce smooth glasslike finish.
 - 3. Sand surfaces that will be exposed to view and dust off.

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4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.03 APPLICATION

- A. Apply finishes according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 1. Use applicators and techniques suited for finish and substrate indicated.
 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
 3. Do not apply finishes over labels or independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.04 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do no scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced wood surfaces.

3.05 STAINING AND FINISHING SCHEDULE

- A. Exterior Staining and Finishing:
 1. Wood timber:
 - Sealer/Finish Coat: High-solids, Alkyd-Oil formula; transparent: PPG Proluxe SRD Wood Finish.
 2. Wood trim, casing, rakes, fascia, and soffits:
 - Prime Coat: Primer, acrylic, exterior: Cabot Problem-Solver Acrylic primer #8022.
 - Intermediate Coat: Acrylic, exterior, matching topcoat.
 - Finish Coat: Acrylic, exterior: Cabot Solid Color Acrylic Siding Stain #800 Series.
 3. Wood siding:
 - Prime Coat: Primer, acrylic, exterior: Cabot Problem-Solver Acrylic primer #8022.
 - Intermediate Coat: Acrylic, exterior, matching topcoat.
 - Finish Coat: Acrylic, exterior: Cabot Solid Color Acrylic Siding Stain #800 Series.

B. Interior Staining and Finishing:

1. Stain Finish:
 - Prep Coat: Conditioner, for interior wood: Minwax Pre-Stain Wood Conditioner Oil Based.
 - Stain Coat: Stain, interior, oil-based, semi-transparent: Minwax Performance Series Tintable Interior Wood Stain 250 VOC
 - Intermediate Coat: Polyurethane, matching topcoat.
 - Topcoat: Polyurethane, oil-based, clear, satin: Minwax Fast-Drying Polyurethane.
2. Clear Finish:
 - Prime Coat: Varnish, matching topcoat.
 - Intermediate Coat: Varnish, matching topcoat.
 - Topcoat: Varnish, oil-based, clear amber, satin: Minwax Performance Series Fast-Dry Varnish

END OF STAINING AND TRANSPARENT FINISHING

SECTION 10 14 00

SIGNAGE

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Signage as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Interior and Exterior Signage
 - b. Accessories

1.02 ACTION SUBMITTALS

- A. Product Data: Manufacturer's illustrated product literature and specifications to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Shop Drawings: Submit shop drawings indicating sign style, lettering font, foreground and background colors, locations, and overall dimensions of each sign.
- C. Selection Samples: For each finished product specified, a complete set of color chips representing manufacturer's full range of available colors and patterns.
- D. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Company specializing in manufacturing Products specified in this Section with minimum three years documented experience.
- B. ADA Accessibility Guidelines: Signage shall comply with the ADA Accessibility Guidelines where applicable. Characters and graphics, including but not limited to copy height, letter stroke, symbols, materials, and finishes indicated on the Drawings are intended as guidelines for compliance. Implement each applicable ADA Guideline. Should conflicts arise, notify the Architect before proceeding.

1.04 DELIVERY, STORAGE AND HANDLING

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- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Package signs, labeled in name groups.

1.05 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.06 WARRANTY

- A. Manufacturer's Warranty: Signage is to be guaranteed for the life of the property against defects in materials and workmanship.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 THERMOFORM ACRYLIC SIGNS

- A. Materials
 - 1. 100% Post-Consumer Recycled ABS Plastic suitable for both interior and exterior applications.
 - 2. Acrylic with a tensile strength that meets ASTM D638 and a flexural strength that meets ASTM D790. It shall have a self-ignition temperature that meets ASTM D1929 with a burn rate meeting ASTM D635 and measuring at D785 on the Rockwell Hardness scale. Suitable for both interior and exterior environments.
 - 3. Decorative laminate and elements as requested.
- B. Fabrication:
 - 1. Thermoformed plate shall be laser or rotary cut for precise dimensions according to specifications.
 - 2. Characters and pictograms shall be compression molded and raised 1/32" to meet ADA compliance regulations.
 - 3. Raised text shall be in all capital letters and accompanied by corresponding Grade 2 Braille.
- C. Signs:
 - 1. Colors:
 - a. Text and graphics as selected by Architect from manufacturer's standard range.
 - b. Background as selected by Architect from manufacturer's standard range.
 - 2. Sign sizes as shown on drawings for each sign type required.

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3. Text Size: 5/8-inch minimum to 2-inch maximum based on a capital letter "I" spaced a minimum of 1/4-inch away from other lines.
4. Font to be selected by Architect from Manufacturer's standard styles.
5. Grade 2 Braille to accompany raised text. Braille to be a minimum of 3/8-inch away from all other raised elements and sign edges for ADA compliance.
6. Pictograms to be provided as required and accompanied by the International Symbol of Accessibility when necessary.
7. Back Plate Thickness: 1/8-inch minimum.
8. Corners: Radius
9. Edges: Straight
10. Texture: Smooth

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verify walls are free of debris and ready for installation of signage prior to proceeding.
- B. Notify Architect of unsatisfactory conditions before proceeding.

3.02 INSTALLATION

- A. Signs to be installed 60-inches above finished floor to baseline of highest tactile copy maximum, and 48-inches above finished floor to baseline of lowest tactile copy minimum.
- B. Signs shall be located on the latch side of doors. Center of signs to be located 9-inches minimum from side of door. Coordinate locations of signs with Architect. Where there is insufficient wall space, signs will be installed on nearest adjacent wall.
- C. Signs to be installed level and plumb.
- D. Interior signs to be installed with manufacturer's recommended mounting hardware. Exterior signs to be mounted using minimum 4 stainless steel screws, drilled, and countersunk at sign corners.

3.03 CLEANING AND PROTECTION

- A. Clean signs in accordance with manufacturer's written instructions.
- B. Protect installed products until completion of project.
- C. Signs shall be free of glue, fingerprints, dirt, grease, and any other imperfections.
- D. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SIGNAGE

SECTION 10 21 00

COMPARTMENTS AND CUBICLES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Compartments and Cubicles as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Phenolic core toilet compartments configured as toilet enclosures and urinal screens.
 - b. Phenolic core benches
- B. Related Work Specified Elsewhere:
 - 1. SECTION 10 28 00: Toilet, Bath, and Laundry Accessories

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For toilet compartments. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Show locations of cutouts for compartment mounted toilet accessories.
 - 2. Show locations of reinforcement for compartment mounted grab bars.
 - 3. Show locations of centerlines of toilet fixtures.
- C. Samples for Initial Selection: For each type of unit indicated. Include Samples of hardware and accessories involving material and color selection.
- D. Samples for Verification: For the following products, in manufacturer's standard sizes unless otherwise indicated:
 - 1. Each type of material, color, and finish required for units, prepared on 6-inch square Samples of same thickness and material indicated for Work.
 - 2. Each type of hardware and accessory.
- E. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

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- A. Product Certificates: For each type of toilet compartment, from manufacturer.

1.04 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet compartments to include in maintenance manuals.

1.05 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Manufacturer of products specified in this Section, with minimum five years' experience in the manufacture of toilet compartments.
- B. Installer Qualifications: Experienced Installer regularly engaged in installation of toilet compartments for minimum three years.
- C. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84, or another standard acceptable to authorities having jurisdiction, by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- D. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities" and ICC/ANSI A117.1 for toilet compartments designated as accessible.

1.06 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.

1.07 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.

1.08 WARRANTY

- A. Special Manufacturer's Warranty: Provide manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship during the following period after substantial completion:
1. Phenolic Core Toilet Partitions: Against delamination: 3 years.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products from General Partitions Mfg. Corp., or comparable products by Bobrick Washroom Equipment, Inc., Bradley Corporation, or approved equal.

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- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 MATERIALS

- A. Phenolic Core: Compressed cellulose impregnated with phenolic resins. Provide smooth material, without creases or ripples.
- B. Aluminum Castings: ASTM B 26/B 26M.
- C. Aluminum Extrusions: ASTM B 221.
- D. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.
- E. Stainless-Steel Castings: ASTM A 743/A 743M.

2.03 PHENOLIC CORE TOILET COMPARTMENTS

- A. Toilet Compartment Type: Ceiling Hung
- B. Urinal Screen Style: Floor-Anchored
1. Screen Height: 48-inches with 12-inches floor clearance.
- C. Door, Panel, and Stile Construction, General: Form edges square without crown molding. Finish edges smooth.
1. Provide exposed surfaces free of pitting, visible seams and fabrication marks, stains, telegraphing of core material, or other imperfections.
2. Core Material: Manufacturer's standard solid resin core of thickness required to provide finished thickness for doors, panels, and stiles.
- D. Stile and Door Construction: 3/4-inch thick.
- E. Panel and Screen Construction: 1/2-inch thick.
- F. Overhead Brace: Provide 3/4-inch by 3-1/2 inch solid phenolic material to provide continuous cross bracing of the ceiling stiles. Finish to match stiles. Secure to each stile with at least 2 stainless steel shoulder screw and barrel nut sets. Brace shall be mounted on the stall side of the stiles.
- G. Shoes & Sleeves: 4-inches high minimum, Type 304 stainless steel with No. 4 satin brushed finish. Provide concealed retainer clips to attach to stile.
- H. Leveling Devices: 7 gauge, 3/16-inches thick, corrosion resistant, chromate-treated, double zinc-plated steel angle leveling bar bolted to stile; furnished with 3/8-inch diameter threaded rods, hex nuts, lock washers, flat washers, spacer sleeves, expansion anchors and shoe retainers.

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- I. Mounting Brackets (Fittings): Continuous full-height angle brackets, or continuous full-height U-brackets; stainless steel or extruded aluminum; Continuous over full height of panels.
- J. Phenolic Core Finish: Manufacturer's standard impregnated. Allow for two colors in each room, one for stiles and panels and one color for doors.
 - 1. Color: As selected by Architect from manufacturer's extended range. Architect shall make selections from plastic laminate manufacturer's line of plastic laminates up to and including the intermediate price range colors and patterns.
 - 2. Edge color: Black or brown.

2.04 HARDWARE

- A. Hardware: Manufacturer's standard heavy duty 18-8, Type 304 heavy-gauge stainless steel with satin finish, including corrosion-resistant, tamper-resistant fasteners:
 - 1. Hinges: Toilet stall doors shall be hung with either:
 - a. Three surface mounted hinges made of 11 gauge type 304 stainless steel. Top hinge shall have concealed cams adjustable to 8 positions with stainless steel reinforcing pin; or
 - b. Continuous 16 gauge stainless steel piano hinge. Hinge shall be full height of door and secures with 14 fasteners.
 - 2. Latch and Keeper: Surface-mounted slide latch with flat rubber-faced combination door strike and keeper, with provision for emergency access, meeting requirements for accessibility at accessible compartments.
 - 3. Coat Hook: Combination hook and rubber-tipped stop, sized to prevent door from hitting compartment-mounted accessories. Provide wall bumper where door abuts wall. Provide formed L-shaped hook without stop at outswing doors.
 - 4. Door Pull: Standard unit on outside of inswing doors. Provide pulls on both sides of outswing doors.

2.05 PHENOLIC CORE BENCHES

- A. Bench and Brace Construction: 3/4 inch thick.
- B. Supports: Aluminum.
- C. Phenolic Core Finish: Manufacturer's standard impregnated.
 - 1. Color: As selected by Architect from manufacturer's full line.
 - 2. Edge color: Black or Brown

2.06 FABRICATION

- A. Ceiling-Hung Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at stiles for connection to structural support above finished ceiling or exposed beams. Provide assemblies that support stiles from structure without transmitting load to finished ceiling. Provide sleeves (caps) at tops of stiles to conceal anchorage.

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- B. Door Size and Swings: Unless otherwise indicated, provide 26-inch wide, in-swinging doors for standard toilet compartments and 36-inch wide, out-swinging doors with a minimum 32-inch wide clear opening for compartments designated as accessible.
- C. Benches: Fabricate as detailed. Provide manufacturer's standard corrosion-resistant anchoring assemblies.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine work area to verify that measurements, substrates, supports, and environmental conditions are in accordance with manufacturer's requirements to allow installation.
 - 1. Proceed with installation once conditions meet manufacturer's requirements.

3.02 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
- B. Install toilet partitions and screens in spaces with operating, temperature controlled HVAC systems. Shield partitions and screens from direct sunlight.
- C. Clearances: Install with clearances indicated on Drawings. Where clearances are not indicated, allow maximum 1/2-inch between stiles and panels, and 1-inch between panels and walls.
- D. Continuous Brackets: Locate wall brackets so holes for wall anchors occur in masonry or tile joints. Align brackets at stiles with brackets at walls.

3.03 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 15 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

3.04 FINAL CLEANING

- A. Remove packaging and construction debris and legally dispose of off-site.
- B. Clean partition and screen surfaces with materials and cleaners in accordance with manufacturer's recommendations.

END OF COMPARTMENTS AND CUBICLES

SECTION 10 28 00

TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Toilet, Bath, and Laundry Accessories as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Public-use shower and washroom accessories
 - b. Childcare accessories
 - c. Custodial accessories
- B. Related Work Specified Elsewhere:
 - 1. SECTION 06 10 00: Rough Carpentry
 - 2. SECTION 10 21 00: Compartments and Cubicles

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Features that will be included for Project.
 - 5. Manufacturer's warranty.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated.
 - 2. Identify products using designations indicated.
- C. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.04 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer with minimum 5 years' experience in the manufacture of the product types specified. If requested submit a list of successful installations of similar products for evaluation by Architect.
- B. Accessibility Requirements: Comply with requirements of ADA/ABA and with requirements of authorities having jurisdiction.

1.06 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.07 WARRANTY

- A. Manufacturer's Warranty for Washroom Accessories: Manufacturer's standard 1 year warranty for materials and workmanship.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products from Bobrick Washroom Equipment, Inc., or comparable products by AJW Architectural Products, Bradley Corp., Brey-Krause, Global Industrial, or approved equal.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.

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- E. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.03 PUBLIC-USE WASHROOM ACCESSORIES

- A. Toilet Tissue (Roll) Dispensers:
 - 1. Surface-Mounted Twin Jumbo-Roll Toilet Tissue Dispensers: Global Industrial Model T9F640933.
- B. Paper Towel (Folded) Dispensers:
 - 1. Surface-Mounted Paper Towel Dispensers: Bobrick Model B-262, furnished with TowelMate.
- C. Liquid-Soap Dispensers:
 - 1. Surface-Mounted Soap Dispensers: Bobrick ConturaSeries Model B-4112
- D. Waste Receptacles:
 - 1. Floor-Standing Waste Receptacles: Bobrick Model B-2280
- E. Grab Bars:
 - 1. Stainless Steel Grab Bars (with snap flange covers): Bobrick Model B-6806
 - 2. Configuration and Length: As indicated on Drawings.
- F. Sanitary Napkin Disposal Units:
 - 1. Surface Mounted Sanitary Napkin Disposal units: Bobrick ConturaSeries B-270
- G. Mirrors:
 - 1. Stainless Steel Channel Frame Mirrors: Bobrick Model B-165 2436 (24"X36")
- H. Hook Strip:
 - 1. Stainless Steel Hat and Coat Rack: Bradley Model 9943 – 3 Hooks

2.04 PUBLIC-USE SHOWER ROOM ACCESSORIES

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A. Shower Curtain Rods:

1. Bobrick ClassicSeries Model B-6107

B. Shower Curtains:

1. Vinyl Shower Curtains and Hooks: Bobrick Model 204

C. Soap Dishes:

1. Solid Surface Soap Dish: 6-inch radius. Fabricated per Section 06 61 16 "Solid Surfacing Fabrications."

D. Robe Hooks:

1. Utility Hooks: Brey-Krause Model S-4933-SS

2.05 CHILDCARE ACCESSORIES

A. Diaper-Changing Stations:

1. Surface-mounted Horizontal Design Baby Changing Stations: Model KB200 as manufactured by Koala Kare Products, a Division of Bobrick. Color as selected by Architect from manufacturer's full line.

2.06 CUSTODIAL ACCESSORIES

A. Mop and Broom Holder:

1. Bradley Model 99954

2.07 FABRICATION

- A. Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install supports attached to building structure for equipment requiring supports.
- C. Grab Bars: Install grab bars to withstand downward force of not less than 250 lbf per ASTM F 446.
- D. Install equipment level, plumb, and firmly in place in accordance with manufacturer's rough-in drawings.

3.04 CLEANING AND PROTECTION

- A. Protect installed products until completion of project.
- B. Clean unit surfaces and leave in ready-to-use condition.
- C. Turn over keys, tools, maintenance instructions, and maintenance stock to Owner.
- D. Touch-up, repair, or replace damaged products before Substantial Completion.

3.05 TESTING AND ADJUSTING

- A. Test each piece of equipment to assure proper operation, freedom of movement, and alignment. Install new batteries in battery-powered items.
- B. Repair or replace malfunctioning equipment, or equipment with parts that bind or are misaligned.

END OF TOILET, BATH, AND LAUNDRY ACCESSORIES

SECTION 22 00 00

PLUMBING

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Plumbing as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
- a. Delegated Design of a complete operational plumbing system
 - b. Valves
 - c. Hangers and Supports
 - d. Vibration and Seismic Controls
 - e. Identification
 - f. Plumbing insulation
 - g. Piping
 - h. Fixtures
- B. Related Work Specified Elsewhere:
- 1. SECTION 23 00 00: Heating, Ventilating and Air Conditioning
 - 2. SECTION 26 00 00: Electrical
- C. The information shown on the Drawings is diagrammatic and is intended to convey the scope of work and general arrangements of systems and equipment. It is the intent of contract documents to call for complete, finished work, fully tested and ready for continuous operation. Basic design concepts must be followed or bettered. The Contractor shall be responsible for coordinating and designing a complete and functional system.
- D. Includes connections to site sewer and water lines. Before starting any work, coordinate locations and elevations of building services with the Site utilities. Discrepancies, if any, shall be corrected as soon as possible.
- E. Required water meters, backflow prevention devices and pits are to be provided by the contractor and coordinated with the authorities having jurisdiction as required.
- F. Coordinate voltages of all electrical devices with electrical contractor.
- G. Any apparatus, appliance, material or work not shown on the drawings by mention or reference in the specifications, or incidental accessories necessary to make the work complete and acceptable in all respects and ready for operation shall be furnished, delivered, and installed under this section of the specifications without additional expense to the Owner.

1.02 ACTION SUBMITTALS

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- A. Submit product data for pipe, tube, fittings, equipment, and couplings.
- B. Valve Schedules: For each piping system. Reproduce on standard-size bond paper. Tabulate valve number, piping system, system abbreviation as shown on tag, room or space location of valve, and variations for identification. Mark valves intended for emergency shutoff and similar special uses. Besides mounted copies, furnish copies for maintenance manuals.
- C. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Water quality test reports.
- B. Submit field quality control reports.
- C. Submit maintenance data for specialties and accessories to include in maintenance manuals.

1.04 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping System Components and Related Materials," for plastic, potable domestic water piping and components.
- C. Comply with NSF 61, "Drinking Water System Components – Health Effects; Section 1 through 9," for potable domestic water piping and components.
- D. All materials, workmanship and equipment performance shall conform with the latest governing edition of the following standards, codes, specifications, requirements, and regulations:
 - 1. All applicable NFPA standards.
 - 2. State and local building codes and ordinances, and requirements of authorities having jurisdiction.
 - 3. American Society of Mechanical Engineers (ASME).
 - 4. American Society of Testing and Materials (ASTM).
 - 5. American National Standards Institute (ANSI).
 - 6. Underwriter's Laboratories, Inc. (UL).
- E. All work shall be performed by or under the direct supervision of a plumber licensed in the State of New Hampshire. All existing plumbing scheduled to remain shall be brought into compliance with the N.H. State Plumbing Code.

1.05 PROJECT CONDITIONS

- A. Prior to submission of bids, trade contractors shall visit the site and/or review the related construction documents to determine the conditions under which the work is to be performed.

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Contractor shall report, in writing, to the Architect, any conditions which might adversely affect the contractor's ability to perform the Work.

1.06 WARRANTY

- A. The trade contractor shall submit manufacturer's warranties for products as specified in this section.
- B. All materials, types of equipment and workmanship furnished under this Section shall carry standard warranty against all defects in material and workmanship for a period of not less than one (1) year from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Subject to compliance with requirements, provide products from one of the manufacturers specified in other Part 2 articles.

2.02 GENERAL MATERIALS

- A. Water Hammer Arrestors: Install appropriately sized water hammer arrestors at fast closing positive shutoff valves to prevent water hammer.
- B. Escutcheons: At all finished wall penetrations, provide chrome-plated, stamped steel, hinged, split-ring escutcheon with set screw. Inside diameter shall closely fit pipe outside diameter or outside of pipe insulation where pipe is insulated. Outside diameter shall completely cover the opening in floors, walls, or ceilings.
- C. Unions: Malleable-iron, Class 150 for low pressure and class 250 for high pressure service; hexagonal stock, with ball-and-socket joints, metal-to-metal bronze seating surfaces; female threaded ends.
- D. Dielectric Unions: Provide dielectric unions with appropriate end connections for the pipe materials in which installed (screwed, soldered, or flanged), which effectively isolate dissimilar metals, to prevent galvanic action, and stop corrosion.
- E. Sleeves: Schedule 40 galvanized, welded steel pipe, ASTM A53, grade.
- F. Sleeve Seals: Modular type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.
- G. Drip Pans: Where required, provide drip pans fabricated from corrosion-resistant sheet metal with watertight joints, and with edges turned up a minimum of 2-1/2 inches. Reinforce top, either by structural angles or by rolling top over 1/4-inch steel rod. Provide hole, gasket, and flange at low point for watertight joint and 1-inch drain line connection.

2.03 GENERAL-DUTY VALVES

A. General:

1. Design: Rising stem or rising outside screw and yoke stems except as specified below.
 - a. Non-rising stem valves may be used only where headroom prevents full extension of rising stems.
2. Pressure and Temperature Ratings: As required to suit system pressures and temperatures.
3. Sizes: Same size as upstream pipe, unless otherwise indicated.
4. Lever handles on all ball valves shall be color coded in conformance with ANSI Standard A13.1.
5. Subject to compliance with requirements, provide products from NIBCO Inc., Milwaukee Valve Company, Inc., or approved equal.

B. Ball Valves:

1. Ball Valves, 4 inches and Smaller: MSS SP-110, Class 150, 600-psi CWP, ASTM B 584 bronze body and bonnet, 2-piece construction; chrome-plated brass ball, standard port for 1/2-inch valves and smaller and conventional port for 3/4-inch valves and larger; blowout proof; bronze or brass stem; Teflon seats and seals; threaded or soldered end connections:
 - a. Operator: Vinyl-covered steel lever handle.
 - b. Stem Extension: For valves installed in insulated piping.
 - c. Memory Stop: For operator handles.

C. Check Valves:

1. Swing Check Valves, 2-1/2 Inches and Smaller: MSS SP-80; Class 125, 200-psi CWP, or Class 150, 300-psi CWP; horizontal swing, Y-pattern, ASTM B 62 cast-bronze body and cap, rotating bronze disc with rubber seat or composition seat, threaded or soldered end connections.
2. Swing Check Valves, 3 inches and Larger: MSS SP-71, Class 125, 200-psi CWP, ASTM A 126 cast-iron body and bolted cap, horizontal-swing bronze disc, flanged or grooved end connections.
3. Wafer Check Valves: Class 125, 200-psi CWP, ASTM A 126 cast-iron body, bronze disc/plates, stainless-steel pins and springs, Buna N seals, installed between flanges.
4. Lift Check Valves: Class 125, ASTM B 62 bronze body and cap (main components), horizontal or vertical pattern, lift-type, bronze disc, or Buna N rubber disc with stainless-steel holder threaded or soldered end connections.

- D. Drain Valves: Chrome plated, bronze body with interchangeable solid bronze wedge and screwed-in bonnet, with hose thread end, brass cap and chain, 200 psi.

2.04 HANGERS AND SUPPORTS

- A. Hangers for pipe up to and including 4-inches shall be swivel ring, split ring, wrought pipe clamp, band, or adjustable wrought clevis type. Hangers for pipes above 4-inches shall be standard clevis or roller.

- B. Saddles and Shields: Provide saddles and shields under piping hangers and supports, factory-fabricated, for all insulated piping. Size saddles and shields for exact fit to mate with pipe insulation.

2.05 VIBRATION AND SEISMIC CONTROLS

- A. Vibration and seismic control devices, manufactured and approved for use, shall be provided as required and as suitable for use and service.
- B. Where seismic restraints are required, the Contractor shall provide calculations, details and locations that are stamped by a professional engineer.

2.06 IDENTIFICATION

- A. Provide pipe markers, line markers, valve tags, valve schedule frames, and equipment markers complying with ANSI A13.1 for lettering size, length of color field, colors, and installed viewing angles of identification devices.
- B. Plastic Pipe Markers:
 - 1. Snap-On Type: Provide manufacturer standard pre-printed, semi-rigid, snap-on, color-coded, pipe markers.
 - 2. Pressure-Sensitive Type: Provide manufacturer standard pre-printed, permanent adhesive, color-coded, pressure-sensitive vinyl pipe markers.
 - 3. Install every 40-feet and at each change in direction.
- C. Plastic Line Marker – Underground Type: Manufacturer's standard permanent burial, bright-colored, continuous-printed plastic type, intended for direct-burial service; not less than 6-inches wide and 4 mils thick. Provide tape with printing which most accurately indicates type of service of buried tape.
- D. Plastic Valve Tags: Provide manufacturer's standard solid plastic valve tags with printed enamel lettering, with piping system abbreviation in approximately 3/16-inch high letters and sequenced valve numbers approximately 3/8-inch high, and with 5/32-inch hole for fastener.
- E. Valve Tag Fasteners: Manufacturer's standard solid brass chain (wire link or beaded type), or solid brass S-hooks of the sizes required for proper attachment of tags to valves and manufactured specifically for that purpose.
- F. Valve Schedule Frames: For each page of the valve schedule. Provide a glazed display frame, with screws for removable mounting on walls. Provide frames of extruded aluminum or plastic with SSB-grade sheet glass or plastic.
- G. Plastic Equipment Markers: Provide manufacturer's standard laminated plastic, color coded equipment markers.

2.07 PLUMBING INSULATION

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- A. All insulation shall be UL approved for a Flame Spread Rating of not more than 25 and a Smoke Developed Rating of not over 50.
- B. All insulation shall conform to requirements of the International Energy Conservation Code (IECC) currently adopted edition.
- C. Pipe insulation shall be fiberglass with ASJ and Zeston fittings or flexible elastomeric thermal insulation.
 - 1. Cold water shall be 1/2-inch.
 - 2. Hot water and hot water return shall be 1-inch.

2.08 WATER PIPING

- A. Underground Domestic Water Piping Within the Building:
 - 1. Copper: Type "K" rolled copper with no fittings below slab.
- B. Aboveground Domestic Water Piping:
 - 1. Copper: Hard drawn copper tube Type "L" with wrought fittings soldered with lead free solder.
 - 2. Mechanical Joints shall not be used without the express written permission of the Architect.

2.09 SANITARY WASTE AND VENT PIPING

- A. Underground Sanitary and Storm Pipe and Fittings:
 - 1. PVC: Schedule 40 PVC with DWV fittings.
- B. Aboveground Sanitary and Storm Pipe Fittings:
 - 1. PVC: Schedule 40 PVC with DWV fittings.
- C. Pressure Sanitary and Storm Pipe (Ejector or Sump Pumps):
 - 1. PVC: Schedule 40 PVC pressure pipe and fittings.

2.10 PLUMBING FIXTURES

- A. Provide plumbing fixtures as scheduled, at locations indicated on Drawings.
- B. Provide required trim for each fixture including faucets, stops, drains, tail pieces, traps, and escutcheons.
- C. Exposed Pipe: Exposed flush, waste and supply pipes at fixtures shall be chromium plated brass pipe, iron pipe size.

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- D. Provide all wall hung fixtures with adjustable carriers and fittings with block feet anchor bolted to floor where required in schedules.
- E. Vandalproofing: Provide vandalproof fittings for all fixtures located in areas accessible to the public.
- F. Compression Tank: Diaphragm type, 100 psi WWP, ASME steel construction, pre-pressurized carbon steel and final exterior coat factory applied. Suitable for commercial potable water systems. Bell & Gossett "PTA-Series" or approved equal.
- G. Floor Cleanouts: Adjustable floor cleanout with Dura-Coated cast iron body, with watertight ABS tapered thread plug, and round scoriated top, adjustable to floor finish. Top shall be polished nickel bronze. As scheduled or approved equal.
- H. Dishwash Sinks: Commercial freestanding stainless steel fabricated basins, backsplash, drain boards, faucets, support legs, basket strainers and accessories as required for a full and complete working unit. Units to meet all accessibility standards and heights. As scheduled or approved equal.

PART 3 – EXECUTION

3.01 GENERAL

- A. Escutcheons: Install pipe escutcheons for pipe penetrations of wall, ceiling, and floor construction.
- B. Sleeves:
 - 1. Install sleeves for passing through concrete and masonry walls, gypsum-board partitions, concrete floors, and where indicated.
 - a. Cut sleeves to length for mounting flush with both surfaces.
 - b. Install large enough sleeves to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - c. Except for below-grade wall penetrations, seal annular space between sleeve and pipe or pipe insulation, using elastomeric joint sealants equal to neutral-curing silicone sealant, Type S, Grade NS, Class 25.
 - 2. Below Grade, Exterior Wall, Pipe Penetrations: Install cast-iron wall pipes for sleeves. Seal pipe penetrations using mechanical sleeve seals. Size sleeve for 1-inch annular clear space between pipe and sleeve for installation of mechanical seals.

3.02 GENERAL-DUTY VALVE INSTALLATION

- A. Install valves as indicated, according to manufacturer's written instructions.
- B. Install valves with unions or flanges at each piece of equipment arranged to allow servicing, maintenance, and equipment removal without system shutdown.
- C. Locate valves for easy access and provide separate support where necessary.

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- D. Install valves in horizontal piping with stem at or above the center of the pipe.
- E. Install valves in a position to allow full stem movement.
- F. General Application: Use ball valves for shutoff duty; globe, ball, and butterfly for throttling duty.

3.03 HANGER AND SUPPORT INSTALLATION

- A. General: Comply with MSS SP-69 and SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- C. Install hangers and supports to allow controlled movement of piping systems, permit freedom of movement between pipe anchors, and facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- D. All hanger materials shall be same material as the pipe or compatible (no dielectric reactions).
- E. There shall be no contact between stud walls or studs and piping, provide PVC spacers as required.

3.04 IDENTIFICATION INSTALLATION

- A. Install pipe markers on each system. Include arrows showing normal direction of flow.
- B. Locate pipe markers and color bands where piping is exposed in finished spaces, machine rooms and accessible maintenance spaces.
- C. Install valve tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in valve schedule.
- D. Valve Tag Application Schedule: Tag valves according to size, shape, color scheme, and with industry standard captions.

3.05 INSULATION INSTALLATION

- A. Tightly butt longitudinal seams and end joints. Bond with adhesive.
- B. Stagger joints on double layers of insulation.
- C. Apply insulation continuously over fittings, valves, and specialties, except as otherwise indicated.
- D. Apply insulation with minimum number of joints.
- E. Apply insulation with integral jackets as follows:

1. Pull jacket tight and smooth.
 2. Double cover circumferential joints with butt strips, at least 4-inches wide, and of same materials as insulation jacket. Secure with adhesive and outward clinching staples along both edges of butt strip and space 4-inches on center.
 3. Longitudinal Seams: Overlap seams at least 1-1/2 inches. Apply insulation with longitudinal seam at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4-inches on center.
- F. Interior Walls and Partitions Penetrations: Apply insulation continuously through walls and partitions, except fire-rated walls and partitions. Apply an aluminum jacket with factory-applied moisture barrier over insulation. Extend 2 inches from both surfaces of wall or partition. Secure aluminum jacket with metal bands at both ends. Seal ends of jacket with vapor barrier coating. Seal around penetration with joint sealer.
- G. Floor Penetrations: Terminate insulation at underside of floor assembly and at floor support at top of floor.
- H. Flanges, Fittings, and Valves – Interior Exposed and Concealed: Coat pipe insulation ends with vapor barrier coating. Apply pre-molded, precut, or field-fabricated segments of insulation around flanges, unions, valves, and fittings. Make joints tight. Bond with adhesive.
- I. Hangers and Anchors: Apply insulation continuously through hangers and around anchor attachments. Install saddles, shields, and inserts. For cold surface piping, extend insulation on anchor legs a minimum of 12 inches and taper and seal insulation ends.

3.06 PIPING INSTALLATION

- A. All water piping must be carefully pitched to facilitate complete seasonal drain-back of the water system. Water piping shall be run parallel and graded evenly to the drainage points. There shall be a 1/2-inch boiler tap type drain valve provided for each low point in the piping, so that all parts of each water system can be readily drawn-off.
- B. Install components having pressure rating equal to or greater than system operating pressure.
- C. Install piping in concealed interior and exterior locations, except in equipment and service areas.
- D. Install exposed interior and exterior piping at right angles or parallel to building walls. Diagonal runs are prohibited, except where indicated.
- E. Service Entrance Piping: Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside building at each service entrance pipe.
- F. Water Meters: Rough-in water piping for water meter installation according to utility company's requirements or Division of Parks Standards. Water meter will be furnished by the Contractor as part of this Work.
- G. Connect water distribution piping to service entrance piping at shutoff valve, and extend to and connect to the following:

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1. Water Heaters: Connect cold-water supply and hot-water outlet piping in sizes required but not smaller than sizes of water heater connections.
2. Plumbing Fixtures: Connect Hot- and cold-water supply piping in sizes required, but not smaller than required by plumbing code.
3. Equipment: Connect hot- and cold-water supply piping as required. Provide shutoff valve and union for each connection.

H. Valve Installation:

1. Sectional Valves: Install sectional valves close to main on each branch and riser serving plumbing fixtures or equipment, and where indicated. Use only ball valves for piping 2-inch NPS and smaller. Provide valves to isolate each bathroom.
2. Shutoff Valves: Install shutoff valve on each water supply to equipment, on each supply to plumbing fixtures without supply stops, and where indicated. Provide shut-off valves for each individual plumbing fixture. Use only ball valves for piping 2-inch NPS and smaller.
3. Drain Valves: Install drain valves for equipment, at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
 - a. Install hose-end drain valves at low points in water mains, risers, and branches.

3.07 WASTE AND VENT PIPING INSTALLATION

- A. Extend building sanitary drain piping and connect to sanitary sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building sanitary drains with building sanitary sewers.
- B. Make changes in direction for drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees for short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch, and 1/8-bend fittings if 2 fixtures are installed back-to-back or side by side with common drainpipe. Straight tees, elbows, and crosses may be used in vent lines. Do not make change in direction of flow greater than 90 degrees. Use proper size of standard increasers and reducers if different sizes of piping are connected. Reducing size of drainage piping in direction of flow is prohibited.
- C. Lay buried building drain piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- D. Install drainage and vent piping at the following minimum slopes, unless otherwise indicated:
 1. Sanitary Building Drain: 2 percent downward in direction of flow for piping 3-inch NPS and smaller; 1 percent downward in direction of flow for piping 4-inch NPS and larger.
 2. Horizontal, Sanitary Drainage Piping: 2 percent downward in direction of flow.
 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stacks.

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- E. Connect service entrance piping to exterior sewerage and drainage piping. Use transition fitting to join dissimilar materials.
- F. Connect drainage piping to service entrance piping, and extend to and connect to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes required, but not smaller than required by plumbing code.
 - 2. Plumbing Specialties: Connect drainage and vent piping in sizes required, but not smaller than required by plumbing code.
 - 3. Equipment: Connect drainage piping as required. Provide shutoff valve and union for each connection. Use flanges instead of unions for connections 2-1/2 inch NPS and larger.

3.08 FIXTURE INSTALLATION

- A. Install fixtures level and plumb according to manufacturers' written instructions, roughing-in drawings, and referenced standards.
- B. Secure supply lines to supports or substrate within pipe space behind fixture.
- C. Install individual stop valve in each water supply to fixture. Use gate or globe valve where specific stop valve is not specified.
- D. Install water-supply stop valves in accessible locations.
- E. Seal joints between fixtures and walls, floors, and counters using sanitary-type, 1-part, mildew-resistant, silicone sealant according to sealing requirements in Section 07 92 00 "Joint Sealants". Match sealant color to fixture color. Seal in accordance with the requirements of the International Plumbing Code.

3.09 TESTING

- A. Test service entrance piping and water distribution piping as follows:
 - 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 - 2. Leave uncovered and unconcealed new, altered, extended, or replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
 - 3. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
 - 4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
 - 5. Prepare reports for tests and required corrective action.

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- B. Test drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
 3. Roughing-In Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10 feet of head. Water level must not drop from 15 minutes before inspection starts through completion of inspection. Inspect joints for leaks.
 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
 5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
 6. Prepare reports for tests and required corrective action.

3.10 CLEANING AND DISINFECTION

- A. Clean and disinfect potable service entrance piping and water distribution piping as follows:
1. Use purging and disinfecting procedure prescribed by the National Standard Plumbing Code or as directed by the Water Department, whichever is the more stringent, or procedure described in either AWWA C651 or AWWA C652 or as described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and let stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for 3 hours.
 - c. Flush system with clean, potable water until chlorine is no longer in water coming from system after the standing time.
 - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows contamination.
 2. Prepare and submit reports for purging and disinfecting activities.
 3. Clean interior of piping system. Remove dirt and debris as work progresses.

END OF PLUMBING

SECTION 22 13 13

FACILITY SANITARY SEWERS

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Facility Sanitary Sewers as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
 - a. Septic tanks
 - b. Pump chambers
 - c. Pumps
 - d. Filters
 - e. Distribution boxes
 - f. Pipe and fittings
 - g. Absorption systems
- B. Related Work Specified Elsewhere:
1. SECTION 22 00 00: Plumbing
 2. SECTION 26 00 00: Electrical
 3. SECTION 31 10 00: Site Clearing
 4. SECTION 31 20 00: Earth Moving

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
1. Include construction details, material descriptions, dimensions of individual components, and profiles.
 2. Include manhole openings, covers, and pipe connections.
- B. Shop Drawings: For absorption system.
1. Include manhole openings, covers, pipe connections, and accessories.
 2. Include piping with sizes and invert elevations.
 3. Include underground structures.
 4. Include other utilities.

1.03 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.04 QUALITY ASSURANCE

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- A. Electrical Components, Devices, and Accessories: Listed and labeled by a testing agency acceptable to authorities having jurisdiction and marked for intended use.
- B. The sewage disposal system shall be installed by a contractor with an approved installer permit issued by the New Hampshire Department of Environmental Services.
- C. All work shall be performed in accordance with NH DES Chapter Env-Wq 1000 "SUBDIVISIONS; INDIVIDUAL SEWAGE DISPOSAL SYSTEMS."

PART 2 – PRODUCTS

2.01 CONCRETE SEPTIC TANKS

- A. Description: ASTM C 1227, precast, reinforced-concrete tank and covers; single chamber, single chamber with internal baffle, or two chambers, as indicated on Drawings.
- B. Design: For A-16 (HS20-44) traffic loading according to ASTM C 890.
- C. Manholes: 24-inch minimum diameter opening with reinforced-concrete risers to grade and frame and cover. Include manhole in center of each septic tank compartment top.
- D. Filter Access: Reinforced-concrete access hole, large enough to remove filter, over filter position.
- E. Inlet and Outlet Access: 12-inch minimum diameter, reinforced-concrete access lids with steel lift rings. Include access centered over inlet and outlet.
- F. Resilient Connectors: ASTM C 923 of size required for piping, fitted into inlet and outlet openings.
- G. Capacity and Characteristics: As indicated on Drawings.
- H. Frame and Cover: Gray Iron Casting, ASTM A 48/ A 48M-03, class 30B, suitable for AASHTO HS 20-44 Highway Loading. Finish: Diamond top non-skid surface. Cover labeled "SEWER."

2.02 PUMP CHAMBERS

- A. Description: ASTM C 913, precast, reinforced-concrete tank and cover; designed for structural loading according to ASTM C 890.
- B. Design: For effluent pump installation.
- C. Manholes: 24-inch minimum diameter opening with reinforced-concrete risers to grade and frame and cover. Include manhole in center of each tank compartment top.
- D. Resilient Connectors: ASTM C 923, of size required for piping, fitted into inlet and outlet openings.
- E. Capacity and Characteristics: As indicated on Drawings.

2.03 PUMPS

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- A. Basis of Design: Subject to compliance with requirements, provide products from Goulds Pumps, or comparable products by Zoeller Company, or approved equal.
- B. Capacities and Characteristics: As indicated on drawings.

2.04 FLOAT SWITCH ASSEMBLY

- A. Float assembly with three float switches mounted on a stainless steel float rack. The floats must be adjustable and must be removable without removing the pump tank.
- B. Floats shall be UL or CSA listed and shall be rated for a minimum 5.0A @ 120 VAC.

2.05 CONTROLS AND ALARMS

- A. Basis of Design Product: Tank Alert XT as manufactured by SJE Rhombus.
 - 1. Voltage: 120 VAC, 50/60 Hz
 - 2. Enclosure: Type 3R water-tight standard.
 - 3. Notification: Audio/Visual; 85 decibels at 10 feet.
 - 4. Test/Silence Switch: Certified to IP66 and IP68 standards.

2.06 FILTERS

- A. Description: Removable, septic-tank-outlet filter that restricts discharge solids to 1/8-inch.
- B. Housing: HDPE or PVC.
- C. Outlet Size: As indicated on Drawings.

2.07 CONCRETE DISTRIBUTION BOXES

- A. Description: Precast concrete, single-chamber box, and cover.
- B. Design: Made according to ASTM C 913, and for A-16 (HS20-44) traffic loading according to ASTM C 890. Include baffle opposite inlet.
- C. Manholes: 24-inch minimum diameter opening with reinforced-concrete risers to grade, and cover with steel lift rings in center of distribution box cover.
- D. Resilient Connectors: ASTM C 923, of size required for piping, fitted into inlet and outlet openings. Include watertight plugs in outlets not required.
- E. Capacity and Characteristics: As indicated on Drawings.

2.08 DISTRIBUTION PIPES AND FITTINGS

- A. Sewer Pipe and Fittings: PVC, complying with ASTM D 3034, Schedule 40, nonperforated, for solvent-cement or elastomeric gasket joints.

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- B. Leaching Pipe and Fittings: PVC, complying with ASTM D 2729, perforated, for solvent-cement joints.
- C. Solvent Cement: ASTM D 2564.

2.09 NONPRESSURE PIPE COUPLINGS

- A. Description: Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground non-pressure piping. Include ends of same size as piping to be joined, with corrosion-resistant-metal tension band and tightening mechanism on each end.
 - 1. Sleeve Materials for Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
 - 2. Sleeve Materials for Dissimilar Pipes: ASTM D 5926, PVC, or other material compatible with pipe materials being joined.

2.10 ABSORPTION-SYSTEM MATERIALS

- A. Filter Material: ASTM D 448, Size No. 24, 3/4 to 2-1/2 inches, washed, crushed stone or gravel; or broken, hard-burned clay brick.
- B. Filter Mat: Geotextile woven or spun filter fabric, in one or more layers, for minimum total unit weight of 3 oz./sq. yd.
- C. Cover for Distribution Pipe: Geotextile woven filter fabric, in one or more layers, for minimum total weight of 3 oz./sq. yd.
- D. Fill Material: Soil removed from trench.

PART 3 – EXECUTION

3.01 EARTHWORK

- A. Excavating, trenching, and backfilling for pipe is specified in Section 31 20 00 “Earth Moving.”
 - 1. Stockpile topsoil for reuse in finish grading without intermixing with other excavated material. Stockpile materials away from edge of excavation and do not store within drip line or remaining trees.
 - 2. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
- B. Excavating and Backfilling for Septic Tanks:
 - 1. Excavate sufficient width and length for tanks to depth determined by tank inlet elevation. Provide level bottom.
 - 2. Backfill with excavated soil, mounding soil above original grade without compacting.
- C. Excavating and Backfilling for Absorption Systems:
 - 1. Excavate for absorption systems of width indicated and 24 inches deep, minimum.

2. Backfill with excavated soil, mounding soil above original grade without compacting.

3.02 SEPTIC TANK INSTALLATION

- A. Install precast concrete septic tanks according to ASTM C 891.
- B. Install septic tanks level.
- C. Connect septic tank to concrete ballast pad, if required.
- D. Install filter in septic tank outlet. Secure filter to septic tank wall. Make direct connections to distribution piping.
- E. Fill septic tank with water.

3.03 DISTRIBUTION BOX INSTALLATION

- A. Install precast-concrete distribution boxes according to ASTM C 891 and at invert elevations indicated. Set level and plumb.

3.04 PIPING INSTALLATION

- A. Comply with requirements for sewer pipe installation specified in Section 22 00 00 "Plumbing."
- B. Install distribution piping according to the following:
 1. PVC Sewer Pipe and Fittings: ASTM D 2321.
- C. Install absorption field piping according to the following:
 1. Pipe perforations shall be created with the size, spacing and orientation shown in the Drawings.
 2. PVC Sewer Pipe and Fittings: ASTM F 481.

3.05 PIPE JOINT CONSTRUCTION

- A. Join distribution piping with and according to the following:
 1. PVC Sewer Pipe and Fittings: ASTM F 402 and ASTM D 2855 for solvent-cemented joints, or ASTM D 3212 and ASTM D 3034 for gasketed joints.
- B. Joint absorption field piping with and according to the following:
 1. PVC Sewer Pipe and Fittings: With solvent-cemented joints according to ASTM F 402 and ASTM D 2321.
- C. Join dissimilar pipe materials according to ASTM D 5926, with couplings and gaskets compatible with pipe materials being joined.

3.06 CLEANOUT INSTALLATION

- A. Install cleanouts according to the following:
 - 1. Inlet and Outlet of Septic Tanks: Cast-iron cleanouts.
 - 2. Inlet and Outlet of Dosing Tanks: Cast-iron cleanouts.
 - 3. Inlet and Outlet of Distribution Boxes: PVC cleanouts.
 - 4. At Each Change in Direction of Sewer Piping: PVC cleanouts.
 - 5. At Ends of Each Row and at Each Change in Direction of Distribution Piping: PVC cleanouts.
- B. Cast-Iron Cleanouts: Install with PVC riser from sewer and distribution piping to cast-iron cleanout housing at grade. Use NPS 4 PVC sewer pipe and fittings with solvent-cemented joints for risers. Attach riser to cleanout housing with rubber gasket for coupling.
- C. PVC Cleanouts: Install with PVC riser from sewer and distribution piping to PVC cleanout at grade. Use NPS 4 PVC sewer pipe and fittings with solvent-cemented joints for risers and cleanout fitting.
- D. Cleanout Support: Set cleanouts in concrete blocks 18-by-18-by-12-inches deep unless location is in concrete pavement.
- E. Set top of cleanout 2-inches above surrounding rough grade or set flush with grade if installed in pavement.

3.07 ABSORPTION-SYSTEM INSTALLATION

- A. Filter Material: place supporting layer of filter material over the compacted base to a compacted depth not less than 6-inches below bottom of pipe.
- B. Install sewer piping at no slope.
- C. Install distribution piping solidly bedded in filter material, with full bearing for each pipe section throughout its length. Maintain pipe alignment with no slope.
 - 1. Install perforated pipe with perforations down and joints tightly closed. Install couplings as required.
 - 2. Install elbow fittings with tight joints.
 - 3. Install absorption-system materials as follows from surface of excavation to grade:
 - a. Bed Size: Provide beds as indicated on Drawings.
 - b. Bottom Filter Material Layer: 8 inches thick below distribution piping.
 - c. Intermediate Filter Material Layer: OD of distribution piping.
 - d. Top Filter Material Layer: 8-inch minimum thickness above distribution piping.
 - e. Filter Mat: Above final filter-material layer.
 - f. Fill: Above filter mat to final grade.
- D. Install filter mat over filter material before backfilling.

3.08 IDENTIFICATION

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- A. Identification materials and their installation are specified in Section 31 20 00 "Earth Moving." Arrange for installation of green, detectable warning tape directly over piping, at outside edges of underground structures, and at outside edges of absorption systems.

3.09 FIELD QUALITY CONTROL

- A. System Tests: Perform testing of completed septic tank system piping and structures according to authorities having jurisdiction.
- B. Additional Tests: Fill underground structures with water and let stand overnight. If water level recedes, locate and repair leaks and retest. Repeat tests and repairs until no leaks exist.

3.10 CLEANING

- A. Clear interior of piping and structures of dirt and other superfluous materials as work progresses.
- B. Maintain swab or drag in piping and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of workday or when work stops.

END OF FACILITY SANITARY SEWERS

SECTION 23 00 00

HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Heating, Ventilating, and Air Conditioning as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
- a. Delegated Design of a complete operational HVAC system
 - b. Ductwork
 - c. Exhaust fans
 - d. Louvers, Grilles, and Diffusers
 - e. Access Doors and Panels
 - f. Vibration isolation
 - g. Motors
 - h. Controls, Adjusting and Balancing
- B. Related Work Specified Elsewhere:
- 1. SECTION 22 00 00: Plumbing
 - 2. SECTION 26 00 00: Electrical
- C. The information shown on the Drawings is diagrammatic and is intended to convey the scope of work and general arrangements of systems and equipment. It is the intent of contract documents to call for complete, finished work, fully tested and ready for continuous operation. Basic design concepts must be followed or bettered. The Contractor shall be responsible for coordinating and designing a complete and functional system.
- D. Coordinate voltages of all electrical devices with electrical contractor.
- E. Any apparatus, appliance, material or work not shown on the drawings by mention or reference in the specifications, or incidental accessories necessary to make the work complete and acceptable in all respects and ready for operation shall be furnished, delivered, and installed under this section of the specifications without additional expense to the Owner.

1.02 ACTION SUBMITTALS

- A. Product Data: For all products, equipment, and materials.
- B. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 INFORMATIONAL SUBMITTALS

- A. Close-Out Submittals: Contractor shall furnish binder copies of an operation and maintenance manual for the mechanical systems, indexed, including but not limited to the following information:
1. Starting and stopping procedure.
 2. Special operating instructions.
 3. Routine maintenance procedures.
 4. Schedule of periodic servicing and lubrication.
 5. Manufacturer's printed operating and maintenance instructions, parts list, illustrations, and diagrams.
 6. One copy of each wiring diagram.
 7. One approved copy of each shop drawing and Contractor's layout drawings.

1.04 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Manufacturers with a minimum of five years' experience manufacturing products in this Section shall provide all products listed.
- B. Installer Qualifications: Products listed in this Section shall be installed by a single organization with at least five years' experience successfully installing specified products on projects of similar type and scope as specified in this Section.

1.05 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Deliver materials to the job site in undamaged condition, in original factory sealed containers, clearly labeled with manufacturer's name and product identification.
- C. Materials shall be stored in a protected and safe area as designated by the Contractor.

1.06 WARRANTY

- A. Provide manufacturer's warranties:
1. The Contractor shall obtain in the Owner's name, the standard written manufacturer's warranties for all materials furnished under this Section where such warranties are offered in the manufacturer's published product data.
 2. The Contractor shall furnish a warranty for all work performed by him for a period not less than one (1) year from the date of Substantial Completion.
 3. All warranties shall be in addition to, and not in lieu of, other liabilities which the Contractor may have by law or other provisions of the Contract Documents.

1.07 INSERTS AND OPENINGS

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- A. The layout for such items as chases, openings, sleeves, and inserts shall be arranged in advance of construction of the work and shall be directed and superintended to see that same is carried out without unnecessary cutting of the building. Any damage that may be done to the building by the Contractor's failure to provide the necessary information for required chases, sleeves, and openings in advance, shall be repaired and corrected prior to the Owner's acceptance of the building.
- B. All sleeves and inserts required for passage and support of piping and ductwork shall be furnished and installed by the Contractor as walls and floors are constructed.

1.08 CODES, STANDARDS AND PERMITS

- A. The work shall comply with requirements of all State and Local codes which apply, and nothing in the Specification shall be interpreted as any infringement of such codes. The following shall apply to the work under this Section:
 - 1. American National Standard Institute Inc. (ANSI)
 - 2. U.S. Department of Commerce, National Bureau of Standards (NBS)
 - 3. American Society of Testing and Materials (ASTM)
 - 4. American Society of Mechanical Engineers (ASME)
 - 5. Underwriters Laboratories Inc. (UL)
 - 6. National Fire Protection Association (NFPA)
 - 7. Plumbing and Drainage Institute (PDI)
 - 8. National Electric Manufacturers Association (NEMA)
 - 9. International Mechanical Code (IMC)
 - 10. Life Safety Code (NFPA 101)
 - 11. American Society of Heating, Refrigeration, Air Conditioning Engineers (ASHRAE)
- B. Where materials or equipment are specified to conform to requirements of the listed standards, the Contractor shall submit proof of such conformance. The label or listing of the specified agency will be acceptable evidence.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 DUCTWORK

- A. Sheet metal ductwork shall be galvanized steel, smooth inside, and true to size. Duct construction, gauges, specifications and supports shall be in accordance with recommendations of the current edition of SMACNA Duct Construction Standards. No standards for ductwork other than SMACNA shall be accepted. All ductwork shall be 1-inch water gauge pressure class.
- B. All joints and seams of all ductwork shall be sealed with UL labeled sealer.

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- C. Sheet metal elbows shall have a radius of 1-1/2 times the duct width measured by duct centerlines. Where conditions will not permit or where indicated on drawings use miter turns with double wall turning vanes.
- D. Provide air splitter dampers where indicated on Drawings and where required for adjustment of air distribution to respective duct branches. Splitter damper shall be constructed in accordance with applicable SMACNA Standards.
- E. After and during assembly of ducts, clean all dirt, grease, rubbish, etc. from both the interior and exterior of ductwork.
- F. After installation, ductwork shall be tested. Where specified compound is used to seal seams, ductwork shall not be subject to air pressure for a period as recommended by the manufacturer but at least 48 hours after assembly.
- G. Where ducts are insulated, provision shall be made for a neat installation of finish around damper operation quadrant, test slots, test openings, access doors and similar operation devices.

2.03 EXHAUST FANS

- A. Steel In-Line Fans: Straight airflow, non-overloading, steel centrifugal wheel with backward curved fan, statically and dynamically factory balanced, heavy gauge steel housing, reinforced, prime coated, internal 1/2-inch thick mat faced glass fiberboard acoustical material, access panel, companion flanges and support brackets, direct drive motor with variable speed drive. As manufactured by Greenheck, ACME, Carnes, Cook or approved equal.

2.04 LOUVERS, GRILLES, AND DIFFUSERS

- A. Louvers: Factory constructed aluminum louvers. 4-inch-deep stormproof blades. Mullions where blade length exceeds 60-inches with 1/2-inch mesh, 14-gauge wire, aluminum bird screen secured in removable frame, secured to back of louver, extruded sections 6063-T5 alloy, 0.8-inch minimum thickness, 4-inch deep unless otherwise called for. One-piece structural head. Sill extension and sill style as required. Stainless steel fasteners. Anodized finish color as selected by Architect. As manufactured by Construction Specialties, Airolite, or approved equal.
- A. Grilles and Diffusers: Aluminum construction with horizontal front bars on 3/4-inch spacing and set at 45 degrees. White finish. Key operated opposed blade damper. 1-1/4 inch wide flange with sponge rubber gasket. As manufactured by Titus, Anemostat, Carnes, Krueger, Metalaire, Price or approved equal.

2.05 FILTERS

- A. Provide one set of new air filters in warm air furnace when construction is completed, and building is ready for final inspection. Provide two sets of replacement air filters to be turned over to the State Park Manager.

2.06 DUCT INSULATION

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- A. All supply ductwork shall be insulated with 3-inch foil faced fiberglass insulation, all intake and exhaust ductwork shall be insulated with 1-1/2 inch foil faced fiberglass insulation. All insulation shall be stapled and taped.

2.07 VIBRATION ISOLATION

- A. Unless otherwise noted, all rotating mechanical equipment shall be mounted and/or hung on vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the building structure. All duct connections to equipment shall be made with canvas connections.

2.08 MOTORS

- A. Single phase, 60 Hz, in compliance with NEMA, Class B temperature rise, 1.15 minimum service factor, 20,000-hour bearings. Premium efficiency type IEEE Standard 112 Method B. Motors for general purposes shall be open-drip-proof, and at dusty or open to weather shall be totally enclosed, fan-cooled (TEFC).

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The HVAC systems and all associated work shall be furnished and installed in accordance with all specified codes for the service intended.
- B. It is the intent of the Specifications and Drawings that the systems shall be furnished and installed complete, including all accessories.
- C. The HVAC Contractor shall furnish and install all piping, ductwork, insulation, valves, equipment, devices, and controls needed and usually furnished in connection with such work whether specifically mentioned or not.
- D. The work shall be carried out under the usual conditions affecting the construction of the type involved, in conjunction with other operators at the site. The HVAC Contractor shall cooperate with the Architect and all Contractors working on the site. He shall coordinate his work with theirs and shall proceed in such manner as not to delay or hinder in any way the progress of the work as a whole. In case of dispute, the Architect shall render a decision which shall be final.
- E. The HVAC Sub-contractor shall secure instructions from the Contractor as to space for storing materials and tools and shall remove all debris, unused materials, and equipment from the premises as promptly as possible.
- F. Piping and ductwork shall be concealed within finished walls and ceilings and under floors and shall be kept 6-inches away from parallel runs of electric wiring. Piping, ductwork, and equipment shall be supported and secured at proper intervals. Exposed piping shall have runs installed parallel or perpendicular to walls or structural members. Crushed or deformed piping and ductwork shall not be installed.

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- G. Care shall be taken to prevent lodgment of plaster, dirt, or trash in piping, ductwork, valve fittings and equipment during the course of construction. Clogged equipment and/or material shall be entirely freed of constriction or shall be replaced.
- H. Piping shall be secured by pipe straps or shall be supported by wall brackets, strap hangers, or ceiling trapeze, fastened by wood screws on wood, expansion bolts on concrete or brick and machine screws or welded threaded studs on steel work.
- I. Flexible connections of short length shall be provided for motors and equipment subject to vibrations or movement.
- J. The HVAC Sub-contractor shall consult all Contract Drawings which may affect the location of any outlets, apparatus, and equipment to avoid all possible interference and permit full coordination with all work. The right to make any reasonable change in location to outlets, apparatus, or equipment up to the time of roughing-in, is reserved by the Architect, and such changes shall be made without additional cost to the Owner.
- K. It shall be the responsibility of the HVAC Sub-contractor to see that all mechanical equipment is made accessible. Valves, controls, and such other apparatus as may require maintenance and operation from time to time shall be positioned to facilitate servicing.

3.02 WORKMANSHIP

- A. All work shall be executed in a workmanlike manner and shall present a neat and mechanical appearance.
- B. All ducts and pipes shall be run parallel or perpendicular to building grid lines and shall be properly graded.
- C. All pipe connections shall be made in a manner which will allow for freedom of movement during expansion and contraction.
- D. Swing joints, expansion loops, and expansion joints with proper anchors required to provide flexibility shall be provided as if they were shown, at no additional cost to the Owner.

3.03 PROTECTION

- A. The HVAC Sub-contractor shall take particular care to protect any finished work from damage caused thereto by his operations or the operations of any other Contractors.
- B. The HVAC Sub-contractor shall provide suitable protection of all equipment furnished under this Contract while stored at the job site and after installation. This protection shall be suitable to guard equipment items against damage from the weather or from construction activity. Such protection shall not be removed until directed by the Architect. The interior and exterior of all ducts, piping and equipment shall be kept in a clean condition, free from dirt and debris. All piping, duct, and equipment items shall be thoroughly cleaned before start-up of any equipment or system.

3.04 CONTROLS, ADJUSTING, AND BALANCING

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- A. Provide a complete automatic control system.
 - 1. Provide wiring and conduit as required to connect devices furnished as part of or adjunctive to this automatic control system regardless of supply. Provide power and control circuits, 120 volts maximum, to electrical panels. Install wiring in accordance with Division 26 "Electrical" and National Electric Code.
 - 2. Provide wiring, conduit, and devices required for proper system operation, including special electrical switches, transformers, disconnect switches, relays, circuit breaker protection, and other devices as required.
- B. Exhaust Fans
 - 1. Fan shall operate whenever the light switch is activated and shall remain operating for 30-minutes after the light switch is turned off. Delay shall be provided by the use of a Timing Relay.
- C. Adjusting and Balancing: Balancing report shall be typed and submitted for review, results shall be guaranteed. Contractor shall be subject to recall to site to verify report information before acceptance of the report by the Owner's representative.
 - 1. Balancing Contractor shall follow the procedures of the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB).
 - 2. Place systems in satisfactory operating condition. Adjusting and balancing shall be accomplished as soon as systems are complete and before Owner takes possession. Change pulleys as required to meet system performance requirements. Perform necessary mechanical adjustments in conjunction with balancing procedure. Replace dampers in systems that cannot be manipulated to satisfy balancing requirements.
 - 3. Air Systems: Test and adjust fan rpm to design requirements. Test and record motor no load and full load amperes and determine operating brake horsepower. Test and record system static pressures, suction, and discharge. Test and adjust zones and system for design exhaust air CFM. Test and adjust system for design outside air CFM.

END OF HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

SECTION 26 00 00

ELECTRICAL

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Electrical systems as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
- a. Delegated Design of a complete operational Electrical system
 - b. Equipment Mounting and Support
 - c. Grounding
 - d. Panelboards
 - e. Wiring in Conduit
 - f. Conductors
 - g. Wiring Devices
 - h. Pull Boxes and Junction Boxes
 - i. Nameplates
 - j. Outlets
 - k. Lighting Fixtures and Lamps
 - l. Terminal Strips
 - m. Safety Switches
- B. Related Work Specified Elsewhere:
1. SECTION 23 00 00: Heating, Ventilating and Air Conditioning
- C. The information shown on the Drawings is diagrammatic and is intended to convey the scope of work and general arrangements of systems and equipment. It is the intent of contract documents to call for complete, finished work, fully tested and ready for continuous operation. Basic design concepts must be followed or bettered. The Contractor shall be responsible for coordinating and designing a complete and functional system.
- D. Any apparatus, appliance, material or work not shown on the drawings by mention or reference in the specifications, or incidental accessories necessary to make the work complete and acceptable in all respects and ready for operation shall be furnished, delivered, and installed under this section of the specifications without additional expense to the Owner.
- E. Coordinate utility service work with local utility companies, general contractor, building conditions and site conditions prior to installation. Provide advance coordination as required for timely connections of temporary and permanent services. Contact utility companies prior to submission of bid. Include all utility fees and costs related to this project in bid.

1.02 ACTION SUBMITTALS

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- A. Product Data: For all products, equipment, and materials.
- B. Build America, Buy America Certification: Made on manufacturers' standard compliance form or on the Product/Material Compliance Form in Section 00 73 13 "Build America, Buy America Requirements," certifying that all iron and steel, manufactured products, and construction materials specified in this section meet the requirements of the Build America, Buy America Act.

1.03 QUALITY ASSURANCE

- A. All material and equipment shall bear a certification of a national certifying organization such as Underwriters Laboratory or Factory Mutual and be installed according to the National Electric Code, local rules and regulations and all other codes and standards listed elsewhere in these Specifications or on the Drawings.
- B. Execute work in a neat and workmanlike manner in conformance with best modern trade practice, (i.e., IEEE, NEC, ANSI, NFPA, NEMA) by competent, experienced, licensed electricians, presenting a neat appearance when completed. Replace work not approved by Owner's Representative without additional charge.

1.04 DELIVERY, STORAGE AND HANDLING

- A. All materials and related accessories shall be delivered and stored in strict compliance with the manufacturer's instructions.
- B. Materials shall be delivered to the site in the original sealed containers or packages bearing the manufacturer's name and brand designation. All materials shall be stored in a clean, well-ventilated, warm area. Care shall be exercised in handling materials during delivery, storage, and installation.

1.05 CODES AND STANDARDS

- A. The complete installation shall comply with the New Hampshire State Building Code, NFPA and other applicable rules and regulations prescribed by the authority having jurisdiction.

PART 2 – PRODUCTS

2.01 MATERIALS, GENERAL

- A. Unless otherwise indicated, the materials to be furnished under this Section shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturers latest standard design that complies with the Specification requirements.
- B. Source Limitation: Obtain products from a single source from a single manufacturer.

2.02 EQUIPMENT MOUNTING AND SUPPORTS

- A. Provide all supports including supplementary steel channels, chains, rods, and guys required for the proper installation, mounting and support of all equipment.

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- B. Supports shall be firmly attached to building structural elements and constructed in an approved manner. Continuously threaded rods less than 3/8-inch in diameter, tie wire, or metal straps are not approved.
- C. Except as otherwise required by the Contract Documents the type and size of supports shall be as determined by the Contractor and shall be of sufficient strength and size to allow only a minimum deflection as required by codes or standards and support the manufacturer's requirements for loading.
- D. Inform all parties as to the location, size, details, and method of attachment of supports and the weight which support is to carry, so that the installation may be coordinated.
- E. Supports shall be installed in a neat and workmanlike manner, perpendicular or parallel to walls, floor, columns, beams, or ceiling.

2.03 GROUNDING

- A. Furnish and install grounding systems conforming to IEEE std. 142 and 241. Comply with requirements of NEC, Article 250 pertaining to electrical grounding system. Comply with applicable requirements of U.L. Standards numbers 467 and 869 pertaining to electrical grounding and bonding. Provide grounding products which are U.L. listed and labeled.
- B. Provide electrical grounding systems required including but not limited to cables, wires, connectors, terminals (solderless lugs), grounding rods/electrodes, plate electrodes, bonding jumper braid, surge arrestors, and additional accessories needed for complete installation.
- C. Provide electrical bonding plates, connectors, terminals, lugs, and clamps as recommended by manufacturer for required applications.
- D. Ground rods shall be solid copper 5/8-inch diameter and 10-feet long.
- E. Upon completion of installation of electrical grounding systems, test ground resistance. Where tests show resistance to ground is over 3 ohms take appropriate action to reduce resistance to 3 ohms or less by driving additional ground rods and/or by chemically treating soil encircling ground rod. Then retest to demonstrate compliance.
- F. All feeders, sub-feeders, lighting branch circuits and all receptacle circuits shall contain a grounding conductor of minimum No. 12 copper with green insulation.
- G. Grounding terminal on receptacles shall be bonded to outlet box with grounding conductor to establish grounding continuity.
- H. Flexible conduit and electric metallic tubing feeder raceways shall include grounding conductor.
- I. Grounding conductors shall be stranded copper wire with THHN green insulation.
- J. Grounding bushings shall be provided for all raceways.

2.04 PANELBOARDS

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- A. Panelboard cabinets shall be of the dead-front or safety type, provided with the size and number of single, double, or triple pole branches required. Cabinets shall be constructed of zinc coated steel and shall conform to Underwriters Laboratories, Inc. Standard for Cabinets and Boxes. Cabinet height shall not exceed 72-inches and shall be mounted so that the distance from the floor to center of the top circuit breaker will not exceed 72-inches. Cabinets shall be provided with trims having adjustable trim clamps. Trims shall be fitted with hinged doors. A typed directory shall be mounted in each frame.
- B. Panelboards shall be surface mounted with branch circuit breakers and main breaker as required.
- C. Panel with main breaker shall be Cutler Hammer, "BR Load Center" or approved equal. Panel shall accommodate a single phase, 200 amp service and have space for minimum 20 circuits.
- D. All branch circuit breakers installed in the panels shall have a minimum short circuit rating as indicated on the panel diagram. Provide factory-assembled molded case circuit breakers of frame size required. Provide breakers with permanent thermal and instantaneous magnetic trips in each pole and with 10,000 AIC minimum fault current limiting protection and ampere rating as required. Construct with over center, trip free, toggle type operating mechanisms with quick make, quick break actions and positive handle trip indication. Provide breaker with mechanical screw type removable connector lugs, AL/CU rated.
- E. At indicated circuits provide circuit breaker with integral ground fault interrupter with 5 milliamperes ground fault trip level.

2.05 WIRING IN CONDUIT

- A. Type MC (metal clad cable) shall be used for branch circuits including power, lighting, and control per NEC.
- B. Electrical metallic tubing (EMT) shall be used for all feeders and empty conduit systems. EMT may be used for branch circuits including power, lighting, and control per NEC. EMT shall not be used where subject to water or moisture conditions. Threadless couplings and connectors used with EMT shall be made up tight. Minimum size of conduit to be 3/4-inch.
- C. Connections to portable equipment from junction boxes and conduit termination to motors shall be made with liquid-tight flexible metal conduit, finished black or grey to match equipment. Flexible connections shall be maximum of 18-inches long with grounding conductor.
- D. Under slab wiring shall be installed in schedule 40 rigid PVC conduit. Comply with NEMA Standards. Under slab conduit shall be 3-inch diameter.

2.06 CONDUCTORS

- A. All conductors installed in raceway shall be insulated, type THW or THWN, 600-volt service, within building and for secondaries. All such wiring shall be color coded. Conductors with higher insulation temperature ratings shall be provided as required.

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- B. Conductor and conduit sizes shown on the drawings are based on copper conductors with THW insulation, unless otherwise noted.
- C. Joints and splices shall be made in a manner equivalent electrically and mechanically to the conductor itself. Connections shall be of the compression type.
- D. Where receptacles or convenience outlets are specified to serve equipment, furnish, install, and connect approved flexible cable and cap to equipment.
- E. Make all final connections, flexible or fixed as required, to all equipment shown requiring final electrical connections.
- F. Wire, conductors, and cable shall be as manufactured by General Electric Company, Southwire, General Cable Corporation or approved equal.

2.07 WIRING DEVICES

- A. Switches, receptacles, and other utilization devices shall be as manufacture by Leviton, General Electric, Hubbell or approved equal. Symbols and nomenclature are that of Leviton. Switches shall have a minimum rating of 20 amperes.
- B. All receptacles and switches shall have a grounding pole and grounding terminal, which shall be connected to the outlet box with grounding conductor to establish grounding continuity.
- C. Verify mounting height of all devices prior to roughing.
- D. Provide heavy-duty duplex receptacles, 2 pole, 3 wire grounding, 20 amperes, 125 volts, with metal plaster ears, back and side wiring, NEMA configuration 5-20R.
- E. Provide device plates for all devices, switches, and receptacles and miscellaneous outlets. Plates shall be stainless steel with ganging and cut-outs appropriate to the indicated circuiting.

2.08 PULL BOXES AND JUNCTION BOXES

- A. Pull boxes and junction boxes shall be of code gauge galvanized steel with screw covers to match, as required and shall be as shown on the Drawings.
- B. Conductors passing through pull boxes shall be identified to indicate their origin and termination.
- C. Pull and junction boxes and covers shall be for indoor use, except provide other types as required because of location.
- D. Covers shall not be installed until installation has been observed. Provide nameplate on cover.

2.09 NAMEPLATES

- A. Provide nameplates for panelboards, switch panels, relays, empty raceways, contactors, pull boxes, junction boxes, motor disconnect switches, and remote switches designating equipment controlled and function.

2.10 OUTLETS

- A. Outlets shall be centered in panels and the spaces provided therefore.
- B. Where outlets of any system occur, provide suitable boxes and conduit so that they may be built in as the work progresses. Box offsets shall be made at all outlets to provide proper adjustment to structural finish.
- C. Receptacle outlet boxes shall have factory installed grounding conductor which shall be connected to receptacle grounding terminal.
- D. Fixture outlet boxes shall have 3/8-inch solid male fixture studs.
- E. Raised covers in open frame construction where no other finish is to be applied, shall have 90-degree corners and edges. Boxes in wall panel finish shall have raised stainless steel covers with rounded edges and corners.
- F. Exposed outlet boxes shall have threaded conduit hubs.

2.11 LIGHTING FIXTURES AND LAMPS

- A. Fixtures shall be complete with all accessories, such as close nipples, extension couplings, connecting straps, screws, locknuts, hickies and plaster rings, to provide complete fixture installation for use with any type of standard outlet or switch box. Special fittings required to support fixtures shall be supplied.
- B. Fixture Schedule: As indicated on Drawings.

2.12 TERMINAL STRIPS

- A. All terminal strips for electrical wiring shall be mounted on a separate 3/8-inch select grade backboard within cabinets or boxes. All terminal strips shall be rated for the ampacity of the wire intended to be connected, but in no case less than twenty amps. All terminal strips shall be identified and each wire at every terminal shall be identified by means of a Brady wire tag.

PART 3 – EXECUTION

3.01 RACEWAYS AND CONDUIT

- A. Raceways shall be supported and secured at intervals of not more than 10 feet, with minimum of two supports. Tie wire or perforated metal straps shall not be used to support or secure raceways or other equipment. Electric metallic tubing shall be supported within 18-inches of each coupling or connector. In finished areas, furnish and install escutcheons for all exposed conduit passing through or entering finished floors or walls.
- B. Raceways shall have runs installed parallel or perpendicular to walls, structural members or intersections of vertical planes and ceilings. Field-made bends and offsets shall be avoided where possible, but where necessary, shall be made with an approved hickey or conduit bending

machine. Crushed or deformed raceways shall not be installed. Trapped raceways shall be avoided. Care shall be taken to prevent the lodgment of plaster, dirt or trash in raceway boxes, fittings, and equipment during the course of construction. Clogged raceways shall be entirely free of obstructions or shall be replaced. Wooden plugs inserted in concrete or masonry are not acceptable as a base for raceway fastenings nor shall raceways or pipe straps be welded to steel structures. Raceways shall be secured by pipe straps or shall be supported by wall brackets, strap hangers or ceiling trapeze fastened by wood screws on wood, toggle bolts on hollow units, expansion bolts on concrete or brick and machine screws or welded studs on steel work.

3.02 OUTLETS

- A. Each outlet in a wiring or raceway system shall be provided with an outlet box to suit the conditions encountered. Each box shall have sufficient volume to accommodate the number of conductors entering the box in accordance with the requirements of the National Electric Code. Boxes shall not be less than 1-1/2 inches deep unless shallower boxes are required by structural conditions and are specifically approved.
- B. Ceiling and bracket outlet boxes shall be not less than 4-inches except smaller boxes may be used where required by the particular fixture to be installed. Boxes shall be installed in a rigid and satisfactory manner and shall be fastened directly with wood screws on wood; bolts and expansion shield on concrete or brick; toggle bolts on hollow masonry units and machine screws or welded threaded studs on steel work. Threaded studs driven in by a powder charge and provided with lock washers and nuts are acceptable in lieu of wood screws, expansion shields or machine screws if permitted by local authorities.

3.03 FIXTURES

- A. All fixtures shall be supported by building structural elements independent of furred or suspended ceilings.
- B. The minimum number of supports for surface mounted or suspended fixtures shall equal one for each 48-inches of length plus one additional support. Additional supports shall be provided if required.

END OF ELECTRICAL

SECTION 31 10 00

SITE CLEARING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Site Clearing as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
 - 1. The Work shall include, but shall not necessarily be limited to:
 - a. Protecting existing vegetation to remain.
 - b. Removing existing vegetation.
 - c. Clearing and grubbing.
 - d. Stripping and stockpiling topsoil.
 - e. Temporary erosion and sedimentation-control measures.

1.02 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2-inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.
- D. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- E. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction and defined by a circle concentric with each tree with a radius 1.5 times the diameter of the drip line unless otherwise indicated.
- F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.03 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from project site.

1.04 INFORMATIONAL SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs or videotape.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.05 QUALITY ASSURANCE

- A. Pre-installation Conference: Conduct conference at Project site.

1.06 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: Notify Dig Safe System for area where Project is located before site clearing.
- C. Do not commence site clearing operations until temporary erosion and sedimentation-control measures are in place.
- D. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- E. Do not direct vehicle or equipment exhaust towards protection zones.
- F. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- G. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 20 00 "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Locate and clearly identify trees, shrubs, and other vegetation to remain. Flag each tree trunk at 54-inches above the ground.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.03 TREE AND PLANT PROTECTION

- A. General: Protect trees and plants remaining on-site.
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.04 EXISTING UTILITIES

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- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.
 - 1. Owner will arrange to shut off indicated utilities when requested by Contractor.
- C. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.
- D. Excavate for and remove underground utilities indicated to be removed.
- E. Removal of underground utilities is included in earthwork sections and with applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security and utilities sections.

3.05 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Remove stumps.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8-inches and compact each layer to a density equal to adjacent original ground.

3.06 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 6-inches in a manner to prevent intermingling with underlying subsoil or other waste materials.
 - 1. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects more than 2-inches in diameter; trash, debris, weeds, roots, and other waste materials.

- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72-inches.
 - 2. Do not stockpile topsoil within protection zone.
 - 3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled and reused.
 - 4. Stockpile surplus topsoil to allow for re-spreading deeper topsoil.

3.07 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SITE CLEARING

SECTION 31 20 00

EARTH MOVING

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Provide all labor, materials, equipment, services, etc. required to furnish and install all Earth Moving as indicated on the Drawings, Specified herein, or otherwise required for a complete and proper job.
1. The Work shall include, but shall not necessarily be limited to:
- a. Preparing subgrades for slabs-on-grade, walks, pavements, turf and grasses and plants.
 - b. Excavating and backfilling for buildings and structures.
 - c. Subbase course and base course for asphalt paving.
 - d. Subsurface drainage backfill for walls and trenches.
 - e. Excavating and backfilling trenches for utilities and pits for buried utility structures.
- B. Related Work Specified Elsewhere:
- 1. SECTION 03 30 00: Cast-In-Place Concrete
 - 2. SECTION 31 10 00: Site Clearing

1.02 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
- 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Base Course: Aggregate layer placed between subbase course and hot-mix asphalt paving.
- C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
- 1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation

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and replacement material will be paid for according to Contract provisions for changes in Work.

2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- G. Fill: Soil materials used to raise existing grades.
- H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders or rock material that exceed 1 cu. yd. for footing, trench and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
- I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- J. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between subgrade and a concrete pavement or a concrete or hot-mix asphalt walk.
- K. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of the following manufactured products required:
1. Geotextiles.
 2. Warning tapes.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
1. Classification according to ASTM D 2487.
 2. Laboratory compaction curve according to ASTM D 1557.

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- C. Blasting plan approved by authorities having jurisdiction.
- D. Seismic survey report from seismic survey agency.
- E. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, that might be misconstrued as damage caused by earth moving operations. Submit before earth moving begins.

1.05 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: Notify "Dig Safe System" for area where Project is located before beginning earth moving operations.
- C. Do not commence earth moving operations until temporary erosion and sedimentation-control measures, specified in Section 31 10 00 "Site Clearing," are in place.
- D. Do not commence earth moving operations until plant-protection measures specified, are in place.
- E. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- F. Do not direct vehicle or equipment exhaust towards protection zones.
- G. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

PART 2 – PRODUCTS

2.01 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

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- B. Satisfactory Soils: Soil Classification Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145, or a combination of these groups; free of rock or gravel larger than 3-inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: NHDOT Item 304.2.
- E. Base Course: NHDOT Item 304.3.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2 inch sieve and not more than 12 percent passing a No. 200 sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Course: Narrowly graded mixture of crushed stone or crushed and uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2 inch sieve and 0 to 5 percent passing a No. 8 sieve.
- I. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.
- J. Sand: ASTM C 33; fine aggregate.
- K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.02 GEOTEXTILES

- A. Subsurface Drainage Textile: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
 - 1. Survivability: Class 2; AASHTO M 288.
 - 2. Grab Tensile Strength: 157 lbf; ASTM D 4632.
 - 3. Sewn Seam Strength: 142 lbf; ASTM D 4632.
 - 4. Tear Strength: 56 lbf; ASTM D 4533.
 - 5. Puncture Strength: 56 lbf; ASTM D 4833.
 - 6. Apparent Opening Size: No. 40.
 - 7. Permittivity: 0.5 per second, minimum; ASTM D 4491.

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8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.
- B. Separation Geotextile: Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M 288 and the following, measured per test methods referenced:
1. Survivability: Class 2; AASHTO M 288.
 2. Grab Tensile Strength: 247 lbf; ASTM D 4632.
 3. Sewn Seam Strength: 222 lbf; ASTM D 4632.
 4. Tear Strength: 90 lbf; ASTM D 4533.
 5. Puncture Strength: 90 lbf; ASTM D 4833.
 6. Apparent Opening Size: No. 60 sieve, maximum; ASTM D 4751.
 7. Permittivity: 0.02 per second, minimum; ASTM D 4491.
 8. UV Stability: 50 percent after 500 hours' exposure; ASTM D 4355.

2.03 ACCESSORIES

- A. Detectable Warning Tape: Acid and Alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6-inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30-inches deep; colored as follows:
1. Red: Electric.
 2. Yellow: Gas, oil, steam, and dangerous materials.
 3. Orange: Telephone and other communications.
 4. Blue: Water systems.
 5. Green: Sewer systems.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.02 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.03 EXCAVATION, GENERAL

- A. Unclassified Excavations: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
 2. Remove rock to lines and grades indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24-inches outside of concrete forms other than at footings.
 - b. 12-inches outside of concrete forms at footings.
 - c. 6-inches outside of minimum required dimensions of concrete cast against grade.
 - d. 6-inches beneath bottom of concrete slabs-on-grade.
 - e. 6-inches beneath pipe in trenches, and the greater of 24-inches wider than pipe or 42-inches.

3.04 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1-inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1-inch. Do not disturb bottom of excavations intended as bearing surfaces.
- B. Excavations at Edges of Tree and Plant-Protection Zones:
 1. Excavate by hand to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

3.05 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.06 EXCAVATION FOR UTILITY TRENCHES

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- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
 - 1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12-inches higher than top of pipe or conduit unless otherwise indicated.
 - 1. Clearance: As indicated on Drawings.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.
 - 1. For pipes and conduit less than 6-inches in nominal diameter, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
 - 2. For pipes and conduit 6-inches or larger in nominal diameter, shape bottom of trench to support bottom 90 degrees of pipe or conduit circumference. Fill depressions with tamped sand backfill.
 - 3. For flat-bottomed, multiple-duct conduit units, hand-excavate trench bottoms and support conduit on an undisturbed subgrade.
 - 4. Excavate trenches 6-inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.
- D. Trenches in Tree and Plant-Protection Zones:
 - 1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 - 2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.07 SUBGRADE INSPECTION

- A. Notify Architect when excavations have reached required subgrade.
- B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 30 mph.
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive bumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.

- D. Authorize additional excavation and replacement material that will be paid for according to Contract provisions for changes in the Work.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.08 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.09 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.10 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:
 - 1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for record Documents.
 - 3. Testing and inspecting of underground utilities.
 - 4. Removing concrete formwork.
 - 5. Removing trash and debris.
 - 6. Removing temporary shoring and bracing, and sheeting.
 - 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.11 UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B. Trenches Under Footings: Backfill trenches excavated under footings and within 18-inches of bottom of footings with satisfactory soil; fill with concrete to elevation of bottom of footings. Concrete is specified in Section 03 30 00 "Cast-In-Place Concrete."

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- C. Backfill voids with satisfactory soils while removing shoring and bracing.
- D. Place and compact initial backfill of satisfactory soil, free of particles larger than 1-inch in any dimension, to a height of 12-inches over the pipe or conduit.
 - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- E. Place and compact final backfill of satisfactory soil to final subgrade elevation.
- F. Install warning tape directly above utilities, 12-inches below finished grade, except 6-inches below subgrade under pavements and slabs.

3.12 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
 - 1. Under grass and planted areas, use satisfactory soil material.
 - 2. Under walks and pavements, use satisfactory soil material.
 - 3. Under steps and ramps, use engineered fill.
 - 4. Under building slabs, use engineered fill.
 - 5. Under footings and foundations, use engineered fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.13 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
 - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.14 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8-inches in loose depth for material compacted by heavy compaction equipment, and not more than 4-inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to AASHTO T 191, AASHTO T 310:
1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12-inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 2. Under walkways, scarify and recompact top 6-inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
 3. Under turf or unpaved areas, scarify and recompact top 6-inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
 4. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.15 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
1. Provide a smooth transition between adjacent existing grades and new grades.
 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
1. Turf or Unpaved Areas: Plus or minus 1-inch.
 2. Walks: Plus or minus 1-inch.
 3. Pavements: Plus or minus 1/2-inch.
- C. Grading Inside Building Lines: Finish subgrade to a tolerance of 1/2-inch when tested with a 10-foot straightedge.

3.16 SUBSURFACE DRAINAGE

- A. Subsurface Drain: Place subsurface drainage geotextile around perimeter of subdrainage trench. Place a 6-inch course of filter material on subsurface drainage geotextile to support subdrainage pipe. Encase subdrainage pipe in a minimum 12-inches of filter material, placed in compacted layers 6-inches thick, and wrap in subsurface drainage geotextile, overlapping sides and ends at least 6-inches.
1. Compact each filter material layer to 85 percent of maximum dry unit weight according to AASHTO T 191, AASHTO T 310 with a minimum of two passes of a plate-type vibratory compactor.
- B. Drainage Backfill: Place and compact filler material over subsurface drain, in width indicated, to within 12-inches of final subgrade, in compacted layers 6-inches thick. Overlay drainage backfill with one layer of subsurface drainage geotextile, overlapping sides and ends at least 6-inches.
1. Compact each filter material layer to 85 percent of maximum dry unit weight according to ASTM D 698.

2. Place and compact impervious fill over drainage backfill in 6-inch thick compacted layers to final subgrade.

3.17 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
 1. Place base course material over subbase course under hot-mix asphalt pavement.
 2. Shape subbase course and base course to required crown elevations and cross-slope grades.
 3. Place subbase course and base course 6-inches or less in compacted thickness in a single layer.
 4. Place subbase and base course that exceeds 6-inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6-inches thick or less than 3-inches thick.
 5. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to AASHTO T 191, AASHTO T 310.
- C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12-inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight according to AASHTO T 191, AASHTO T 310.

3.18 FIELD QUALITY CONTROL

- A. Special Inspections: Engage a qualified special inspector to perform the following special inspections:
 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 2. Determine that fill material and maximum lift thickness comply with requirements.
 3. Determine, at the required frequency, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

- E. Testing agency will test compaction of soils in place according to AASHTO T 191, AASHTO T 310, as applicable. Tests will be performed at the following locations and frequencies:
1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests.
 3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify, and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.19 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.20 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF EARTH MOVING