Wyoming Life Resource Center
Aquatic Center Renovation and Addition

State Construction Dept. Bid No. 26-0612
Architect Project No. 2505

CONSTRUCTION DOCUMENTS - PROJECT MANUAL

Divisions 1-33



Owner:
Wyoming Department of Health
Hershler Building 122 West 25th Street
Cheyenne, Wyoming 82002

Architect of Record:
Plan One/Architects

4020 Dewar Drive, Suite A
Rock Springs, Wyoming 82901

Date: February 2, 2026

plan one / architects
cheyenne 307.514.4575 cody 307.587.8646 rock springs 307.352.2954 bozeman 406.219.5992 billings 406 245 6363

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STATE OF WYOMING
WYOMING STATE CONSTRUCTION DEPARTMENT
PROCUREMENT SECTION
700 WEST 21st STREET
CHEYENNE, WY 82002

REQUEST FOR BIDS
NO. 26-0612

AQUATIC CENTER RENOVATION AND ADDITION
FOR THE
STATE OF WYOMING
WYOMNG LIFE RESOURCE CENTER
WYOMING DEPARTMENT OF HEALTH
LANDER, WYOMING

BID DUE DATE AND TIME:
March 12, 2026 – 1:00 P.M. Mountain Time

AGENCY REPRESENTATIVE: Nate Miller
TELEPHONE NO. (307) 431-7905

PROCUREMENT REPRESENTATIVE: Lenora Simpson
TELEPHONE NO. (307) 777-3558

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1. Notice for Request for Bids (Advertisement)

RFB #26-0612

The Wyoming State Construction Department, Procurement Section, on behalf of the Wyoming Department of Health, Wyoming Life Resource Center (WLRC) (Procuring Agency), will receive bids until 1:00 p.m. Mountain Time on March 12, 2026, through the Public Purchase online bidding system for the Aquatic Center Renovation and Addition, located at 206 Center Street Lander, WY 82520.

Project Description: This project will consist of limited renovation of the pool area and a 1,303 square foot addition to the mechanical equipment room. Scope of work includes site work, concrete foundations, stud framing with brick veneer, asphalt shingle roof with vented nail base system, gutters and downspouts, H.M. Doors and frames, high performance paint systems, gypsum ceilings, mechanical systems relocation and modifications, lighting and electrical.

Estimated Project Completion date is: December 31, 2026

A mandatory pre-bid meeting will be conducted at 1:00 p.m. MT on Tuesday, February 24, 2026, starting at the WLRC Administration Building, 300 Circle Drive, Lander, WY 82520. Bidders must sign the attendance sheet prior to the commencement of the pre-bid meeting. The Procuring Agency will reject bids from any bidder who has not signed the attendance sheet prior to the commencement of any mandatory pre-bid meeting. Bidders in attendance at the Pre-Bid meeting are required to represent the company from which they are employed.

Bid documents available by download from publicpurchase.com. Companies wishing to download the bid must have a Public Purchase account.

Project Manager: Nate Miller, nate.miller@wyo.gov, (307) 431-7905

Pre-Bid Meeting

A Pre-Bid Meeting will be held as follows:

> Mandatory, held at 1:00 p.m. MT on Tuesday, February 24, 2026, starting at the WLRC Administration Building located at 300 Circle Drive, Lander, WY 82520.

The Procuring Agency will reject bids from any bidder who has not signed the attendance sheet prior to the commencement of any Mandatory pre-bid meeting.

Bidders in attendance at any Pre-Bid meeting are required to represent the company from which they are employed.

Only the written answers posted officially to the procurement website or official addenda issued by the Procuring Agency are the official position on an issue, and these answers shall become part

of the Request for Bid. Verbal clarifications offered during the pre-bid meeting shall not be binding upon the Procuring agency until reduced to writing and published as such, to ensure all bidders have access to the same information.

Bidders are cautioned to make careful observations of existing conditions at the site.

Addenda

The Procuring Agency reserves the right to amend this Request for Bid before the submission date through written addenda. Addenda will be published through the Public Purchase online bidding system. It is the bidder's responsibility to check publicpurchase.com for addenda.

The bidder shall acknowledge their receipt of Addenda on the Bid Form found herein.

Note quality of products specified. Any bidder may submit a Substitution Request that will identify how the proposed substitution is comparable and substantially the same level of quality or better as the specified item. Only substituted items approved equal by the Procuring Agency will be allowed to be bid. Substitution Request must be submitted through the Public Purchase online bidding system no later than the deadline for submission of questions and clarifications. If the Procuring Agency accepts a bidder's substitution request, the Procuring Agency must publish all acceptable substitutions in a written Addenda submitted on the Public Purchase online bidding system.

Submission of Bids

Bids for the WRLC Aquatic Center Renovation and Addition, Lander, Fremont County, Wyoming, shall be submitted at publicpurchase.com until 1:00 p.m. MT, March 12, 2026.

Bids received after the time and date specified will not be considered. If your submission has not completely uploaded by the 1:00 p.m. deadline, the Public Purchase system will lock and your response will be incomplete and deemed non-responsive and eliminated from the evaluation process.

No bid will be considered which is not submitted on the attached "Bid Form", signed by a proper official of the company bidding in the space provided therefore.

No bid will be considered that modifies, in any manner, any of the contract language included with this RFB and any other related documents.

In case of an error in the extension of prices in the bid the unit prices will govern.

Each project valued equal to or above $150,000.00, a bid is required to have a bid deposit in the amount of ten percent (10%) of the total bid, which shall be in the form of a bid bond, cashier's check, or certified check (a copy will not be accepted) drawn on a reliable bank and made payable to the State of Wyoming (no personal checks will be accepted), or an electronic bid bond with

Surety 2000. The Procuring Agency will release the bid bond if the bidder is awarded the contract; when the contract is executed; and when all additional documentation required by contract is received and approved.

Any bid deposit is given as a guarantee that the bidder will execute the contract document, for the awarded bidder. All other deposits will be returned to the bidders after the successful bidder is determined. In the event that the successful bidder decides not to accept the contract, the second lowest bidder will be given the option of accepting the work. If the second lowest bidder does not elect to accept the award of the bid, the project will be re-bid. The fact that the Department deposits the bid deposit should in no way be taken as acceptance of your bid.

When the bid is equal to or above $150,000.00 the successful bidder must make a good faith attempt, within twenty (20) calendar days after notification of the award, to deliver to the Procuring Agency an executed Bidder's Performance and Payment Bond in the amount of at least equal to one hundred percent (100%) of the accepted bid as security for the faithful performance of the contract. **Note: The cost of the Performance and Payment Bond must be included in the bid amount. If bidder does not provide the Performance and Payment bond, the Procuring Agency may move forward with next lowest responsible bidder.

The bond shall be submitted on bonding forms as provided by the Department and shall meet all requirements as to form and execution.

If during the contract period change orders increase the original contract amount, it will be necessary for the Bidder to furnish the Procuring Agency additional bonding coverage so that 100% of the Contract Amount is always provided.

Modifications or Withdrawal of Bids

A bid that is in the possession of the Procuring Agency may be modified through the Public Purchase online bidding system submission bearing the signature or name of the person authorized for bidding, provided it is received prior to the date and time of the bid opening. If project value is equal to or above $50,000.00 the modified bid should not reveal the bid price but should indicate the addition, subtraction, or other change in the bid.

A bid may be withdrawn by the bidder up to the time and date of the bid opening. Bids can be withdrawn through the Public Purchase online bidding system before the due date and time set forth in this document.

Bids may not be withdrawn for a period of thirty (30) days after the bid opening.

Bids which modify any of the provisions of the Bidding or Contract documents will not be considered.

If a bid is accepted and the bidder then fails to furnish any portion of the services agreed to in the bid, that bidder may be eliminated from consideration for future projects.

Preparation of Bids

A bid may be rejected if it modifies any of the provisions, contract, specifications, or minimum requirements of the Request for Bid.

Award and Contract Information

The successful bidder shall be required to enter into and sign a formal Contract with the Procuring Agency containing terms required by the Attorney General. The contract language will control over any language contained within this RFB and any related documents that conflict or are inconsistent with the fully executed Contract.

The Procuring Agency shall account for invoices against the Contract. All payments shall be handled through the Project Representative.

The prime bidder shall post on the construction site a prominent sign citing W.S. 16-2-112, stating that any subcontractor or material man shall give notice to the prime bidder of a right to protection under the bond or guarantee and that failure to provide the notice shall waive the protection.

Failure of the successful bidder to furnish the equipment, materials, supplies, or perform the service awarded from the bid shall eliminate the bidder for a period of time as determined by the Procurement Section.

Resident bidder preferred: "The contract shall be let to the responsible certified resident making the lowest bid if the certified resident's bid is not more than five percent (5%) higher than that of the lowest responsible non-resident bidder." (W.S. 16-6-102–16-6-107).

"Resident" means a natural person, association or business entity authorized to be formed under title 17 of the Wyoming statutes, or the laws of another state that are functional equivalent, and that is certified as a resident by the Department of Workforce Services following receipt of an affidavit executed and sworn to by a chief executive officer of the entity setting forth information required by the Department to determine compliance with this act and prior to bidding upon the contract or responding to a request for bid. NOTE: Bidder to include his residency number on their bid form sheet.

All bidders are required to register and/or bond with the following:

Secretary of State, W.S. 17-16-1501 (A foreign corporation may not transact business in this state until it obtains a certificate of authority from the Secretary of State), (307) 777-7311. All resident bidders are required to contact the Secretary of State to see if they need to register.

The Department of Workforce Services, Unemployment Tax Division (307) 235-3217.

The Department of Workforce Services, Worker's Safety and Compensation Division (307) 777-6763.

The Department of Workforce Services, Labor Standards Division W.S. 27-1-106, (307) 777-7261.

The Department of Revenue, Excise Tax Division, W.S. 39-15-303, (307) 777-5200.

A successful resident bidder shall not subcontract more than thirty percent (30%) of the work covered by this contract to nonresident contractors per W.S. 16-6-103.

Preference is hereby given to materials, supplies, agricultural products, equipment, machinery and provisions produced, manufactured or grown in Wyoming, or supplied by a resident of the state, quality being equal to articles offered by the competitors outside of the state (W.S. 16-6-106).

Wyoming laborers shall be employed exclusively under this contract, provided that non-resident laborers may be used when Wyoming laborers are not available for such employment from within the State or are not qualified to perform the work involved. The Bidder shall inform the Wyoming Department of Workforce Services Resources Center nearest the construction site of the bidder's employment needs. As used in this paragraph "Laborer" means a person employed to perform unskilled or skilled manual labor for wages in any capacity and does not include independent Bidders. "Resident" as used in this paragraph includes any person who is a citizen of the United States or a person who is authorized to work in the United States by an agency of the Federal government, and has resided in the State of Wyoming for at least one (1) year immediately preceding his application for employment (W.S. 16-6-201 to 16-6-206).

For all public works awarded by the state that is equal to or exceeds $1,000,000.00 or more a bidder who commits to ensure that not less than ten percent (10%) of the labor hours shall be worked by apprentices shall have his bid considered as if his bid were one percent (1%) lower than the actual dollar value of his bid (W.S. 16-6-901 to 16-6-902). Contact the Department of Workforce Services.

The bidder expressly warrants to the Procuring Agency that it has the ability and expertise to perform the contract services if awarded. In doing so it shall use the highest standards of professional workmanship.

The Procuring Agency and Department reserve the right to reject any or all bids, to waive any informality or technical defect in the bid, or to award the contract in whole or in part, if deemed to be in the best interest of the State to do so.

2. Special Provisions

State Parties

This Request for Bid is issued by the Wyoming Department of Health, Wyoming Life Resource Center.

Throughout this document and others in connection with this project, various references are made, or will be made to the "State". Generally, whenever this reference appears, the term "State" incorporates all state agencies that will be working on this project. “Department” and the “Procuring Agency” are more particularly defined in Chapter One of the SCD's procurement rules.

Content and Procurement Points of Contact (includes Questions and Answers)

Point of Contact

The Procuring Agency is the primary point of contact from the Request for Bid release date until the completion of the project.

Questions and Clarifications

Written questions about the procurement process should be submitted through the Public Purchase online bidding system until 3:00 p.m. MT, March 3, 2026. Any questions received after the deadline may not be accepted or considered. Each question should be submitted individually.

It is the bidder’s responsibility to review the Public Purchase online bidding system for answers to questions, addenda, or bid tabulations. Telephone calls, emails, or faxes may not be accepted.

Responses will not identify the bidder that submitted the question. Only the written answers issued by the Procuring Agency are the official position on an issue, and these answers shall become part of the Request for Bid.

Restrictions on Communication with Procuring Agency Staff

Until a bidder is selected and the selection is announced, bidders are not allowed to communicate with Procuring Agency staff except:

Procuring Agency representative;

Written questions through the Public Purchase online bidding system;

If a bidder violates this restriction, the Procuring Agency reserves the right to reject the bid.

Advertising Award Conditions

A fully executed contract shall be completed with the Procuring Agency before the successful bidder(s) may advertise the award of the contract or the services being provided. Any such publicity shall be made pursuant to the terms of the Contract.

The successful bidder(s) shall not refer to awards in commercial advertising in a manner that states or implies that the firm or its services are endorsed or preferred by the State of Wyoming, the Department or the Procuring Agency.

The Procuring Agency may award contracts to more than one bidder and may divide the award in as many ways as necessary, if it is in the best interest of the Procuring Agency.

Beginning Work

The successful bidder(s) shall not perform any work that could be billed until a contract has been executed and the successful bidder has received a written notice to proceed. The Procuring Agency will not pay for any work completed by the bidders(s) before the contract execution date.

Cost of Preparing Bids

All costs incurred for preparing the bid and for other procurement related activities are solely the bidder's responsibility. The Procuring Agency will not provide reimbursement for these costs.

Risks and Liability

By submitting a bid, the bidder assumes any and all risks and liability associated with information in the bid and its release.

Insurance

The bidder is required to furnish insurance documents per the provisions contained in the contract.

Questions regarding the required insurance coverages and limits for this project should be submitted in writing in accordance with instructions outlined in Section 2.

Misrepresentation of Information

Misrepresentation of a bidder's status, experience, or capability in the proposal may result in disqualification of that proposer from the selection process. Discovery of

litigation or investigations in a similar area of endeavor may, at the discretion of the Wyoming State Construction Department and Procuring Agency, preclude the bidder from the selection process and consideration for future work with the State.

Disposition of Bids

All material submitted becomes the property of the State of Wyoming, which is under no obligation to return any of the material submitted.

Legal Considerations

This Request for Bid is issued under the provisions of W.S. 9-2-3006.

Bidders are presumed to know all requirements of the Request for Bid and applicable law. Any bid that fails to meet all requirements may, at the option of the Procuring Agency, be rejected without further consideration.

Liquidated Damages

Liquidated damages will be assessed as per the provisions contained in the contract.

Prevailing Wages

Wyoming Prevailing Wage Act of 1967: Not less than the prevailing hourly rate of wages for work under this bid shall be paid to all workers unless otherwise specified in writing by the State Construction Department Director prior to this bid opening. Applies only if the contract amount is $100,000.00 or more.

Warranty

Warranties required by the contract documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion. Prior to the expiration of one (1) year after the date of Substantial Completion, or such longer period as may be prescribed by the contract documents, by law, or by the terms of any applicable special guarantee, the Contractor shall promptly, without cost to the State of Wyoming and in accordance with the State of Wyoming's written instructions, either correct such defective work or, if it has been rejected by the State of Wyoming, remove it from the site and replace it with non-defective work. If the Contractor does not promptly comply with the terms of such instruction, the State of Wyoming may have the defective work corrected or the rejected work removed and replaced, and all costs incurred therefore, including compensation for additional professional services, shall be paid by the Contractor and its sureties. The remedies provided in this section are in addition to all other remedies available

to the State of Wyoming under applicable laws and shall not be construed as exclusive of any other legal right or remedy available to the State of Wyoming.

3. Key Dates

The following schedule of events is subject to change at the sole discretion of the Procuring Agency:

Event Description	Date	Time
RFB Released	2/5/26	N/A
Pre-Bid Meeting Mandatory	2/24/26	1:00 p.m.
Closing date for questions submitted via Public Purchase	3/3/26	3:00 p.m.
Answers to questions to be posted on Public Purchase	3/5/26	3:00 p.m.
Bid Submission Due Date	3/12/26	1:00 p.m.
Tentative Contract(s) Award Date	4/1/126	N/A
Estimated Project Completion Date	12/31/26	N/A

Bid documents available by downloading from publicpurchase.com.

4. Specifications and Plans

Scope of services will be tailored to the specific services required for each project as shown in the attached Specifications and Plans. Specifications dated February 2, 2026 and Plans dated February 2, 2026 for this project will be included with the project information.

5. Submission of Bids

Bid Content

Bids shall be submitted on the approved Bid Forms with all required documents.

All submissions through an online platform shall be printable and searchable.

Pages shall be numbered consecutively and may not exceed the total number of pages specified, whether printed single-sided or double-sided.

Required Bid Form information for this bid is shown in Table 5.1.

Table 5.1

Bid Form Section	Under $50,000 (Competitive Negotiation)	Equal to or above $50,000 (Competitive Sealed Bidding)
1. Bid Form Section 1, which includes: ● Bid Price ● Alternate and deductive alternate (as applicable) ● Residency Identification ● Apprenticeship training program (as applicable) ● Date	X	X
1b. Bid Form Section 2, which includes: ● Acknowledgement of any addenda ● Bonding Capacity ● Signature Page		X
2. Proposed Work Plan (Scope of Work)	X	
3. Proposed Timeline (Completion Date)	X	
4. Qualifications (including applicable licensing and certifications)		X
5. References and Experience		X
6. Current Work including availability of required services, products, equipment or supplies		X
7. Proof of any Required Insurance	X	X

Submission

Bids will be received as follows:

> Bids will be received in electronic format and all bidding documents shall be uploaded to publicpurchase.com by 1:00 p.m. MT on March 12, 2026.

The bidder assumes full responsibility for timely delivery at the location specified for receipt of bids.

The bid tabulation can be viewed on publicpurchase.com after the bid opening date and time.

Bids shall be submitted on the Bid Form provided in Section 8.

List of Proposed Subcontractors and Suppliers

A list of proposed subcontractors and certificates of residency for each Wyoming resident proposed shall be submitted within twenty-four (24) hours of bid opening. The list for each proposed subcontractor for the project shall include but is not limited to:

> Description of work.
>
> Contractor's full legal name including Doing Business As (DBA) or subsidiaries.
>
> Subcontractor's anticipated percentage of work on this project (all subcontracts, self-performed work, general conditions and suppliers must equal the bid amount).
>
> Suppliers.
>
> Residency.
>
> Contact information (phone number and email address).

The general contractor is only allowed to change the list of subcontractors after submission with the approval from the Procuring Agency. Changes to bids must be in compliance with SCD Rules Chapter 3 Section 19(b). Failure to submit the required list and certificates may result in rejection of the bid.

Acceptance of Bids

The Procuring Agency reserves the right to reject any and all bids, and to waive bid irregularities as defined in the SCD Rules, Chapter 1 Section 2 when it is determined to be in the best interest of the State of Wyoming to do so. Bids with improper or missing signatures or lacking legible numerical values shall be rejected by the Department or Procuring Agency.

The Procuring Agency reserves the right to use procurement software and related technology, including but not limited to opening, noting, and time stamping receipt of bids.

Bids received after the exact time noted above will not be accepted on the Public Purchase online bidding system and will be rejected. Any bid modification received after the exact time noted will not be considered.

The Department Director may delegate the exercise of the Department's discretion to Procuring Agency.

Nothing in this section shall be construed to supersede, eliminate, or abrogate the authority of a public board, commission, or other such body to similarly exercise discretion in rejecting bids or solicitations.

Submission of a bid constitutes bidder's affirmation that all terms and conditions of the bid constitute a binding offer that shall remain firm for a period of NINETY (90) from the closing date of the RFB, but Procuring Agency may, at its sole discretion, release any bid.

6. Evaluation and Award

Evaluation of Bids Checklist

Table 6.1

Evaluation Summary	MET/NOT MET
Completed Bid Form Section 1	MET/NOT MET
Completed Bid Form Section 2	MET/NOT MET
Completed Bid Bond Form	MET/NOT MET
Signature Page	MET/NOT MET
Required Proof of Insurance	MET/NOT MET
Qualifications	MET/NOT MET
References and Experience	MET/NOT MET
Current Work	MET/NOT MET

Award

The Procuring Agency shall:

Evaluate bids to determine which bidders are responsible in accordance with the evaluation criteria set forth in the invitation for bids and requests for bids.

Determine which bid, submitted by a responsible, qualified bidder, offers the lowest cost to the Procuring Agency; and

If the project is valued equal to or above $50,000.00, the Procuring Agency shall notify the Department in a written recommendation specifying the apparent responsible, qualified low bidder including justification for the recommendation. The contract shall be awarded to the lowest responsible bidder whose bid meets the requirements and criteria set forth in the solicitation for bids or request for bids.

A contract may not be awarded to a bidder submitting a higher quality item than that designated in the invitation for bids or request for bids, unless such bidder is also the lowest bidder as determined by value analysis or life-cycle cost formulas.

7. Bid Form Instructions

Fill in all blank spaces for bid prices in ink or typewritten words. The Bidder must include all unit cost items, lump sum and all alternates shown on the Bid Form. No segregated or qualified bids will be accepted. Total bid prices are to be written both by words and by figures in case of conflict the written word will apply.

Bids shall be completed and signed in ink or by verifiable electronic signature. Bids by partnerships must be signed with the partnership name by one of the partners, followed by the signature and designation of the partner signing.

The name of the person signing shall be typed or printed below the signature.

If erasures or other changes appear on the bid forms, each erasure or change must be initialed by the person signing the bid. Bid form will only be accepted if signed with ink or electronically. Do not deface or alter any portion of the original bid. Remarks should be shown as annotations to the bid.

8. Bid Form-Section 1

RFB #26-0612

STATE OF WYOMING
WYOMNG LIFE RESOURCE CENTER
WYOMING DEPARTMENT OF HEALTH
LANDER, WYOMING 82520

The undersigned hereby proposes to furnish all labor and materials and to perform all work necessary for the AQUATIC CENTER RENOVATION AND ADDITION, LANDER, FREMONT COUNTY, Wyoming, in accordance with the Request for Bids, Special Provisions, Contract Provisions, and Specifications and Drawings, as applicable for considerations in the following amounts:

AQUATIC CENTER RENOVATION AND ADDITION: The bid number below is inclusive of all work identified within the contract documents dated February 2nd, 2026. Such work shall include all remedial work required within Existing Therapy Pool Room No. E-112, including complimentary work related to any HVAC adjustments entering/exiting the space, as well as any upgrades/repairs required to walls encompassing the space where indicated. Work shall also include all scope required to construct new Pump Room E-121, including the relocation/reconfiguration of mechanical equipment from Room E-115 as noted.

LUMP SUM: $_____
(_____)
(WRITTEN IN WORDS)

AQUATIC CENTER RENOVATION: The bid number below (included in total lump sum above) shall be inclusive of all work identified within the contract documents dated February 2nd, 2026. Such work shall be limited to remedial work required within Existing Therapy Pool Room No. E-112, including complimentary work related to any HVAC adjustments entering/exiting the space, as well as any upgrades/repairs required to walls encompassing the space where indicated.

$_____
(_____)
(WRITTEN IN WORDS)

AQUATIC CENTER NEW PUMP ROOM ADDITION: The bid number below (included in total lump sum above) shall be inclusive of all work identified within the contract documents dated February 2nd, 2026. Work shall include all scope required to construct new Pump Room E- 121, including but not limited to the civil/site, concrete, roofing, relocation/reconfiguration of mechanical equipment within/from Room E-115 as indicated.

$_____
(_____)
(WRITTEN IN WORDS)

BID ALLOWANCE: The amount indicated number below (included in total lump sum above) shall be representative of inclusion of the contingency allowance as defined in Section 01 21 00 – Allowances of the Contract Documents.

$_____
(_____)
(WRITTEN IN WORDS)

If the project's estimated cost is equal to or exceeds $1,000,000, will apprentices work at least 10% of the labor hours?

____ No

____ Yes

____ Project's estimated cost is below $1,000,000

Are you submitting this bid as a Wyoming Contractor Resident Bidder?

____ No

____ Yes _____
(Resident Contractor Certification Number)

My bid complies with W.S. 16-6-103. The project will be awarded based on the Bidder's statement of meeting the requirements of W.S. 16-6-103. Subsequent information verifying the statute requirements have been met will be required up to and including possible audits. The audit is to confirm that the bidder has not subcontracted more than a total of 30% of the work covered by his contract to non-resident subcontractor and nonresident sub-tier contractors.

Dated_____, 2026

9. Bid Form - Section 2

STATE OF WYOMING
WYOMNG LIFE RESOURCE CENTER
WYOMING DEPARTMENT OF HEALTH
LANDER, WYOMING 82520

Bidder to acknowledge receipt of the Addenda:
Addenda No. #_____/ #_____/ #_____/ #_____/

That for and in consideration of the amount shown above, this Bidder shall perform the work of Aquatic Center Renovation and Addition in a good workmanlike and substantial manner and to the full satisfaction of and under the supervision of the design professional, or representative, in charge of the Project. In the prosecution of the work, the Bidder shall, at his own cost and expense, furnish all labor, machinery, tools, equipment, materials, and supplies except such equipment and materials which shall be furnished by the State of Wyoming, as provided in the Specifications, Contract, and shall perform the work in strict conformity with the Specifications relative to this work.

In consideration of the covenants and agreements to be kept and performed by the Bidder and for the faithful performance of this Bid and the completion of the work embraced herein according to the plans, specifications, drawings and conditions herein contained and referred to, the Procuring Agency shall pay and the Bidder shall receive and accept as full compensation for everything furnished and done by the Bidder under this bid and also for all loss or damage arising out of the nature of the work, the action of the elements or from any unforeseen contingencies or difficulties encountered in the prosecution of the work, the prices stipulated above.

Said work shall be commenced upon notice to proceed and shall be completed per contract documents provided, however, that should the Bidder be delayed in the prosecution of the work by any act, neglect or fault of the State of Wyoming, or by any damage caused by fire, flood or other casualty over which the Bidder has no control, then the time herein set for the completion of the work may be extended as determined by mutual agreement of the parties hereto. Weather conditions are not considered as a casualty that will allow an extension. Contractors shall be responsible to consider and include within the Contract Price the climatic conditions of the location of the project that may delay the work. The State of Wyoming hereby reserves the right to accept and make use of any portion of said facilities before completion of the entire work without invalidating the contract, or binding said State of Wyoming, and accept the remainder of the work or any portion thereof, whether completed or not and without in any way thereby releasing the bid bonds of said Bidder.

It is also agreed by the parties hereto that the Request for Bids, Drawings, Contract, and Specifications, herein referred to, form an essential part of this document and whether the same are attached hereto or on file in the Wyoming State Construction Department at Cheyenne, Wyoming, they shall have the same force and effect as if spread at length herein.

If written Notice of Acceptance of this bid is delivered to this bidder within ten (10) calendar days after date of bid opening, this bidder will within twenty (20) calendar days after date of such notice, execute and deliver the Bidder's Bonds and all required insurance documents.

The bidder hereby agrees that should he be awarded this contract, bidder shall not discriminate against any person who performs work there under because of age, race, religion, color, sex, national origin or ancestry.

The bidder also covenants and agrees and that this Bid is made without collusion with any other person, firm or corporation; that he has carefully examined the Request for Bids, Contract, and Specifications and Plans governing the work included in this Bid, and has inspected the site of the work and fully understands the physical conditions under which the work must be performed.

The bidder may be required to perform extra work as set forth in the contract.

_____
Name of Bidder

_____
Mailing Address City, State, Zip

_____
Remit/Billing Address City, State, Zip

_____
E-mail address

_____
Print Name of Person Signing

_____
Signature

_____
Phone Number

_____
Tax ID Number- please do NOT provide social security number

Name, Title and Email Address of Person Signing the Contract:

_____
Name & Title (Print)
Email Address _____

10. Signature Page

THIS FORM MUST BE SIGNED AND SUBMITTED WITH YOUR BID

BY SUBMISSION OF A BID, THE BIDDER CERTIFIES:

Prices in this bid have been arrived at independently, without consultation, communication or agreement for the purpose of restricting competition.

No attempt has been made nor will be by the bidder to induce any other person or firm to submit a bid for the purpose of restricting competition.

The person signing this bid certifies that he/she is authorized to represent the company and is legally responsible for the decision as to the price and supporting documentation provided as a result of this request for bid.

OWNERSHIP AND CONTROL:

Bidder's Legal Structure:

_____ Sole Proprietorship _____General Partnership

_____Corporation _____Limited Partnership

_____Limited Liability Company _____Other_____

If Bidder is a sole proprietorship, list:

Owner Name_____ Phone (_____)_____

Mailing Address_____

City_____ State_____ Zip_____

Beginning date as owner of sole proprietorship_____

Provide the names of all individuals authorized to sign for the bidder:

NAME (printed or typed)	TITLE
_____	_____
_____	_____
_____	_____
_____	_____

VERIFICATION

I certify under penalty of perjury, that I am a responsible official (as identified above) for the business entity described above as Bidder, that I have personally examined and am familiar with the information submitted in this disclosure and all attachments, and that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including criminal sanctions which can lead to imposition of a fine and/or imprisonment.

_____
Signature

_____ _____
Name and Title Date

11. Qualifications (including applicable licensing/certification)

☐ The following page limits apply: 3

Company Name_____

Please describe your company's qualifications that demonstrate your ability to successfully deliver the required services similar to the Specification and Plans?

How many years has your company been providing construction services similar to the Specification and Plans?

List all applicable licensing and/or certifications that the proposed key personnel have obtained:

Name of Key Personnel/ Role on Project	License/Certification Type	Date Received
FIRST NAME LAST NAME/ SUPERINTENDENT		

12. References and Experience

☐ The following page limits apply: 3

Company Name_____

Experience:
If more space is needed, submit on a separate sheet(s) of paper.

Within the last five years, has your organization ever failed to complete any work awarded to it or has any officer of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If "yes", explain)

Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers? (If "yes", explain)

Has your organization filed any lawsuits or requested arbitration with regard to any contracts within the last five years? (If "yes", explain)

References:
List only references and projects similar to the type and size of this bid. Projects must have been completed within the past five (5) years.

Describe any scheduling challenges presented by the project and how your company will address these challenges.

Reference Contact Information

Provide three (3) current or recent references; information may be in any format

Name of Project	
Project Type and Scope	
Project Location	
Description of work	
Reference name and Title	
Reference Contact Information (Address, Phone number, Email)	

Name of Project	
Project Type and Scope	
Project Location	
Description of work	
Reference name and Title	
Reference Contact Information (Address, Phone number, Email)	

Name of Project	
Project Type and Scope	
Project Location	
Description of work	
Reference name and Title	
Reference Contact Information (Address, Phone number, Email)	

13. Current Work

(Including availability of required services, products, equipment or supplies)

Company Name_____

Current Work Affidavit:
List major projects your organization has in progress, giving the name of the project, owner, contract amount, percent complete and scheduled completion date. Complete and submit a "Work in Progress Form" and include the Total Work of work in progress and under contract.

Work in Progress

Date Awarded	Scheduled Completion Date	% Complete	Owner	Project Name	Contract amount	Description of Project

14. Proof of any Required Insurance

Provided by each bidder as part of their bid; attached to the contract of the selected bidder.

15. List of Attached Documents

Sample Contract
Specifications
Plans
Contractor's Affidavit
Prevailing Wages

PRIOR APPROVAL REQUEST FORM:

ONE PRIOR APPROVAL PER FORM. FILL IN ALL BLANKS.
PROJECT NO.:_____.
PROJECT TITLE:_____.

We hereby submit for your review the following prior approval for the following specified material for the project referenced above.

Section	Page	Specified Material
_____	_____	_____.

Proposed Prior Approval:_____

_____.

Attach duplicate copies of this form, complete technical data, specifications, colors, laboratory tests and any other information applicable to the proposed prior approval, see Section 012500.

Include complete information on changes to Drawings and/or Specifications which the prior approval will require for its proper installation.

1. Does the prior approval affect dimensions shown or indicated on drawings?

   _____

2. Will the undersigned pay for any changes to the building design, including engineering and detailing costs caused or required by the prior approval?

   _____

3. What effect does the proposed prior approval have on other trades?

   _____

4. What are the differences between the proposed prior approval and the item/product/material specified?

   _____

   _____

5. Guarantees/Warranties of the proposed prior approval and specified item/product/material are:
   ____Same.
   ____Different (Explain).

   _____
   (Attach copies of Guarantees/Warranties).

6. Will the proposed prior approval have any effect on the contract time?

____No.
____Yes (Explain).

_____

7. Will the proposed prior approval have any effect on the contract Price?

____No.
____Yes (Explain).

_____

____This request is accompanied by a self-addressed, stamped envelope.

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item/product/material.

All requests for prior approval must be submitted through and approved by the Architect.

Submitted By:

_____
Signature

_____
Type or Print Name & Title

_____
Firm

_____
Address

_____
Date

_____
Phone

For Use By Architect/Engineer:

____Received too Late to Review.

____Incomplete Submittal.

____Not Accepted.

____Approved, Except as Noted:

_____

_____

____Approved

_____
Signature Plan One / Architects

_____
Date

CONTRACT BETWEEN
[INSERT AGENCY'S NAME]
AND
[INSERT CONTRACTOR'S FULL LEGAL NAME]

1. **Parties**. The parties to this Contract are the State of Wyoming, [State Construction Department/School District/Agency] (Owner) whose address is [Address]; and [Name] (Contractor), whose address, for the purposes of this Contract, is [Address].

2. **Purpose of Contract**. The purpose of this Contract is to set forth the terms and conditions by which Contractor shall accomplish all the construction services required (Work) for the [_____] at the [_____] in [_____], Wyoming (Project). The Project Site shall be located at [Address/Coordinates]. All Work shall be performed pursuant to the Contract and Attachment A, [Attachment Name], which [is/are] more fully described in Subsection 10.K below, and [is/are] incorporated into this Contract by this reference.

3. **Term of Contract**. This Contract is effective when all parties have executed it (Effective Date). All services shall be completed during the term specified herein. The performance period of this Contract is from the Effective Date through the end of the latest warranty period (Contract Time). The Contract shall remain in effect until Contractor's services are completed to the satisfaction of Owner or the Contract is terminated, whichever is earlier.

A. The Work to be performed under this Contract shall be commenced within [spell out days] (___) calendar days after receiving the Notice to Proceed, and, subject to any authorized extension, substantial completion shall be achieved no later than [Enter substantial completion date].

B. Permitting Contractor to continue and finish the Work or any part of it after the time fixed for its completion, or after the use of additional Contract Time, will in no way operate as a waiver on the part of Owner of any of its rights under this Contract.

C. Nothing in this Contract shall be interpreted or deemed to create a right or expectation that this Contract will be extended beyond the term described herein. Any extension of this Contract shall be initiated by Owner, and shall be effective only after it is reduced to writing and executed by all parties to the Contract.

4. **Defined Terms Used in the Contract.** [**Instructions:** Remove any title reference that is not relevant to the contract, otherwise fill out the needed information and delete these instructions.]

A. **Construction Change Directives**. [**Instruction:** delete Subsection A and renumber accordingly in all contracts where Owner is a School District.] Owner may issue Construction Change Directives to Contractor, as appropriate. Construction Change Directives are written directives prepared and signed by Owner for changes in the Work when Owner and Contractor have not agreed on adjustment, if any, in the Contract Sum or Contract Time, or both. Owner may use

SAMPLE CONTRACT SUBJECT TO CHANGE

Construction Change Directives to direct changes in the Work which, if not expeditiously implemented, might delay the Project. Upon receipt of a Construction Change Directive from Owner, Contractor shall promptly proceed with the change in the Work described therein.

B. **Construction Documents.** Construction Documents include [**Instruction:** make sure that all documents related to the scope of work to be incorporated into the contract are listed here and eliminate those that are not necessary. Fix the sentence as necessary to make it accurately reflect those documents incorporated.] Plans, Specifications, addendums, and Attachment[s] [A,B,C] which [is/are] incorporated into this Contract by this reference (the "Contract").

C. **Owner's Designee**. [**Instruction:** Select option 1 or 2 below, remove italics, and delete the other option.] [Option 1] *Owner's Designee is, [Name], [Address] and is an employee of the Owner authorized to act on its behalf.* [Option 2] *Owner shall designate an employee or agent who is authorized to act on behalf of Owner as the Owner's Designee. Owner shall notify Contractor in writing of the identity of Owner's Designee.* [Remaining language is mandatory.] All notices required to be provided to the Owner shall be provided to the Owner's Designee.

D. **Owner's Representative**. Owner's Representative is the entity hired to represent Owner on-site. Owner's Representative for this project is [Name].

E. **Professional Service Provider**. Professional Service Provider is [Name] of [Company], [Address].

F. **Construction Superintendent**. The Superintendent is [Name] of [Contractor], [Address]. At all times during the progress of the Work, Contractor shall assign a superintendent thereto. The Superintendent shall be capable of reading and understanding the Contract, including all Construction Documents, and experienced in the type of work being performed. The Superintendent shall not be replaced without written notice to Owner and Professional Service Provider except under extraordinary circumstances. The Superintendent shall be Contractor's representative at the Site and shall have authority to act on behalf of Contractor, including full authority to execute orders or directions given by Owner without delay, and to provide materials, equipment, tools, labor and incidentals promptly, as required. All communications given to or received from the Superintendent shall be binding on Contractor.

G. **Surety**. The Surety is an entity hired by Contractor at the behest of Owner to assume Contractor's financial responsibility to Owner in the event of Contractor's breach or inability to complete the Work.

5. **Payment**.

A. Owner agrees to pay Contractor for the services described herein. The total payment under this Contract shall not exceed [spell out dollar amount] dollars ($__,___.00)

SAMPLE CONTRACT SUBJECT TO CHANGE

(Contract Sum). No payment shall be made for services performed before the Effective Date of this Contract. [Additional Optional Language: Payment shall be made from Owner budget.]

B. **Schedule of Values**. Before submitting an Application for Payment, Contractor shall submit to Owner and Professional Service Provider a schedule of values allocated to various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as Owner and Professional Service Provider may require. This schedule, unless objected to by Professional Service Provider or Owner, shall be used as a basis for reviewing Contractor's Applications for Payment.

C. **Applications for Payment**. Contractor shall submit to Professional Service Provider and Owner an itemized Application for Payment invoice for operations completed in accordance with the schedule of values monthly. Such Application shall be notarized, supported by data substantiating Contractor's right to payment, such as copies of requisitions from subcontractors and material suppliers, and reflect retainage.

(i) [**Instructions:** where the owner is a school district, choose option 1. For all other circumstances, choose option 2. Delete the option not chosen and these instructions, and remove all italics.] [Option 1:] *Such Applications shall not include requests for payment on account of changes in the Work which have been properly authorized by interim determinations of Professional Service Provider and Owner, but which are not yet included in Change Orders.* [Option 2:] *Such Applications shall not include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives, or by interim determinations of Professional Service Provider and Owner, but which are not yet included in Change Orders.*

(ii) Such Applications shall not include requests for payment for portions of the Work for which Contractor does not intend to pay a subcontractor or material supplier, unless such work was self-performed or has otherwise been performed by others whom Contractor intends to pay.

(iii) Payments shall be made for materials and equipment delivered and suitably stored at the Site for subsequent incorporation in the Work. If approved in advance by Owner, payment may similarly be made for materials and equipment suitably stored off the Site at a location agreed upon in writing between Owner and Contractor. [**Instructions:** delete this sentence if not applicable] Materials stored off site must be stored in state, and cannot be stored out of state. Payment for materials and equipment stored on or off the Site shall be conditioned upon compliance by Contractor with procedures satisfactory to Owner establishing Owner's title to such materials and equipment or otherwise protecting Owner's interest in the

SAMPLE CONTRACT
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materials, and shall include the costs of applicable insurance, storage, and transportation costs to the Site for such materials and equipment stored off the Site.

(iv) Contractor warrants that title to all Work covered by an Application for Payment will pass to Owner no later than the time of payment. Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from Owner shall, to the best of Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances in favor of Contractor, subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work. Contractor shall submit with each Application for Payment a Contractor's Affidavit pursuant to Wyo. Stat. § 16-6-1001.

D. **Certificates for Payment**. Contractor shall submit an Application for Payment to the Professional Service Provider and Owner. Following certification, in whole or part, by Professional Service Provider, Owner shall pay to Contractor the payment amount that the Professional Service Provider and Owner determine is properly due.

(i) After the Professional Service Provider issues a Certificate for Payment, Owner's acceptance of the Certificate of Payment shall not constitute a final acceptance of the Work included in the Certificate. Such acceptance shall be provisional and subject to Professional Service Provider's and Owner's further evaluation of the Work for conformance with the Contract as the work progresses. Owner's acceptance of a Certificate for Payment shall not be a representation that Owner and/or Professional Service Provider has:

(a) Made exhaustive or continuous on-site inspections to check the quality or quantity of the Work;
(b) Reviewed construction means, methods, techniques, sequences, or procedures;
(c) Reviewed copies of requisitions received from subcontractors and material suppliers and other data requested by Owner to substantiate Contractor's right to payment; or
(d) Made examination to ascertain how or for what purpose Contractor has used money previously paid on account of the Contract Sum.

E. **Acceptance of Work and Inspection**. Contractor shall allow the Professional Service Provider and Owner access to all parts of the Work such that both the Professional Service Provider and Owner may inspect all materials and each detail of the Work and shall furnish them with such information and assistance as required to make a complete and detailed inspection. Payment for Work is conditioned on

SAMPLE CONTRACT SUBJECT TO CHANGE

Professional Service Provider and Owner's inspection of materials on site and acceptance of work as being in accordance with the Construction Documents.

(i) Contractor, prior to acceptance of the Work, shall remove or uncover such portions of the finished Work as directed by Owner and Professional Service Provider. After examination by Owner and Professional Service Provider, Contractor shall restore the Work to the standard required by this Contract. Should the Work exposed or examined prove acceptable, the uncovering, removing and replacing, recovering, or restoration of the parts removed shall be paid as extra work. Should such work prove defective, it shall be replaced at Contractor's expense.

(ii) All of the Work which does not conform to the requirements of this Contract, or which was unauthorized, shall be considered unacceptable, and may be ordered to be removed and replaced in an acceptable manner, at Contractor's expense, as determined by Owner. If Contractor fails to comply with any such order, Owner may follow the Contract provisions for issuance of a stop work order. Owner may have unauthorized or unacceptable Work removed and may deduct from any monies due or which become due to Contractor all costs of removal and correction.

(iii) If Owner prefers to accept defective or nonconforming Work, it may do so instead of requiring its removal and correction, in which case a change order shall be issued to reflect a reduction in the Contract Sum, where appropriate. Owner may condition its acceptance of nonconforming Work upon Contractor's agreement to a longer warranty period for the nonconforming Work.

F. **Decisions to Withhold Certification**. Professional Service Provider and/or Owner may withhold a Certificate for Payment, in whole or in part, to the extent reasonably necessary to protect Owner, if in Professional Service Provider's and/or Owner's Designee's opinions the requisite representations as to the quality or completion of the Work invoiced cannot be made to Owner. If Professional Service Provider and Owner do not certify payment in the amount of the Application, Professional Service Provider and Owner shall notify Contractor in writing no later than seven (7) days after receipt of the Application. If Contractor, Professional Service Provider, and Owner cannot agree on a revised amount, Owner shall promptly issue a modified Certificate for Payment for any amount Owner approves. Such a Certificate is not subject to a seven (7) day time requirement. Professional Service Provider and Owner may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify all or part of a Certificate for Payment previously issued, to such extent as may be necessary in Professional Service Provider's or Owner's Designee's opinion to protect Owner from loss for which Contractor is responsible, including loss resulting from acts and omissions because of:

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(i) Defective Work not remedied;

(ii) Third-party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to Owner is provided by Contractor;

(iii) Failure of Contractor to make payments properly to subcontractors or for labor, materials, or equipment;

(iv) Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

(v) Damage to Owner or another contractor;

(vi) Reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or

(vii) Persistent failure to carry out the Work in accordance with the Contract. When the above reasons for withholding certification are removed, certification shall be made for amounts previously withheld.

G. **Progress Payments**. After Professional Service Provider and Owner have issued a Certificate for Payment, Owner shall make payment in the manner and within the time provided in the Contract. The amount of the Progress Payment shall be determined pursuant to Wyo. Stat. § 16-6-702. A retainage of [five percent] [(5%)] of the entire Contract Sum shall be withheld until final payment is made to Contractor. If it becomes necessary for Owner to take over the completion of the Contract, all amounts owed Contractor, including the withheld retainage, shall first be applied toward the cost of completion of the Contract, as provided in Wyo. Stat. § 16-6-703.

(i) Upon receipt of payment from Owner, Contractor shall promptly pay each subcontractor the amount to which said subcontractor is entitled, on account of such subcontractor's portion of the Work. Contractor shall, by appropriate agreement with each subcontractor, require each subcontractor to make payments to sub-subcontractors in a like manner.

(ii) Owner and Professional Service Provider shall not have an obligation to pay nor to effectuate the payment of money to a subcontractor except as may otherwise be required by law.

(iii) Payment to material suppliers shall be treated in a manner similar to that provided in Subparagraphs 5.G(i) and 5.G(ii) above.

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(iv) Neither a Certificate for Payment, a progress payment, partial or entire use, nor occupancy of the Project by Owner shall constitute acceptance of any Work not performed in accordance with the Contract.

H. **Failure of Payment**. If Owner does not pay Contractor the amount certified by Professional Service Provider and Owner within forty-five (45) days after the date established in the Contract, then Contractor may, upon seven (7) additional days' written notice to Owner and Professional Service Provider, stop the Work until payment has been received. The Contract term shall be extended appropriately and the Contract amount shall be increased by the amount of Contractor's reasonable costs of shut-down, delay, and start-ups, plus interest at one and one-half percent (1.5%) per month.

I. **Final Completion and Final Payment**. When the Work is complete and ready for final inspection and acceptance, Contractor shall notify the Professional Service Provider. If, following the completion of a final inspection, the Professional Service Provider determines Contractor has completed the Work, that the Work is acceptable under the Contract, and that the Contract has been fully performed, Owner shall make Final Payment to Contractor. Final Payment constitutes the entire unpaid balance of the Contract Sum, including any amount retained under Subsection 5.G. Final Payment shall be made only as provided in Wyo. Stats. §§ 16-6-116 and 117.

(i) Final Payment shall not be made until after Contractor files with Owner a sworn statement, as required in Wyo. Stat. § 16-6-117, stating that all claims for material and labor performed under the Contract have been made and paid to all subcontractors and suppliers. Contractor payments shall not be withheld due to claims against Contractor's Surety Bond except as required by Wyo. Stat. § 16-6-117, if applicable.

(ii) Contractor shall post notification of requirements to claim bond protection at the job site as required by Wyo. Stat. §16-6-121(f), if applicable. Contractor, if applicable, shall ensure that its agreement with the Surety shall not relieve the Surety from liability on any bond following Final Payment to Contractor based on Contractor's sworn statement of no disputed claims for material or labor if outstanding material or labor claims or liens exist for which materialmen or laborers properly followed the notification procedures described in Wyo. Stat. § 16-6-121. Owner may seek indemnification from Contractor for any liabilities that result from Contractor's failure to abide by this provision.

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6. **Owner's Remedies**. The Owner may, at its discretion, seek remedies in accordance with this Section. This Section is not exhaustive and shall not be interpreted to prohibit the Owner from pursuing additional remedies available to it.

A. **Default.** Owner may seek remedies under this Section for cause constituting Default. Cause constituting Default includes, but is not limited to, circumstances where the Contractor, at any time:

(i) Refuses or neglects to supply sufficient and properly skilled workers;

(ii) Refuses or neglects to supply materials of the proper quality;

(iii) Fails in any respect to follow revised construction schedules;

(iv) Fails in any respect to complete the Work with promptness and diligence; or fails in the performance of any of the covenants contained herein; or

(v) Fails to correct such default or neglect with diligence and promptness within one (1) work day of written notice from Owner.

B. **Notice.** Owner shall provide written notice to Contractor detailing the Default for which it may seek a remedy under this Section.

C. **Remedies Short of Termination.** If Contractor fails to remedy the defect or neglect with diligence and promptness within one (1) work day of written notice from Owner, Owner may, without additional written notice and without prejudice to any other remedy, seek to remedy the defect or neglect pursuant to this Subsection. Owner's remedies shall include but shall not be limited to:

(i) Providing such additional labor, materials, or services as Owner deems reasonably necessary to ensure timely completion of the Work required by this Contract. If Owner exercises this provision, it shall deduct the cost of all additional labor, materials, or services procured under this provision from any money then due or thereafter to become due to Contractor under this Contract; or

(ii) Terminating this Contract for the Work, enter the Site, and taking possession of, for the purpose of completing the Work included under this Contract, all materials, tools, and appliances thereon. Owner may then employ any other person or persons to finish the Work, and provide the materials required under this Contract.

D. **Expenses.** Owner shall be entitled to recover all of its expenses under this Section, including all labor, materials, and services (whether by Owner or others) and any other cost or expense (including attorneys' fees) or damages incurred as a result of Contractor's default. If such expense exceeds the unpaid balance of the amount to

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be paid under this Contract, Contractor shall pay the difference to Owner upon demand.

E. **Remedies upon Termination.** If this Contract is terminated, Contractor shall not be entitled to receive any further payment under this Contract until the Work is completed. If, at any time prior to Final Payment, Owner becomes aware of evidence of any invoice, bill, lien, or claim (Claim) arising from Contractor's operations under this Contract, or any other agreement between the parties for which Owner, or any property, might be or become liable or subject to, Owner shall have the right to retain, out of any payment then due or thereafter to become due to Contractor, an amount sufficient to discharge such Claim. Upon discovery of such a Claim, Owner shall notify Contractor of the Claim and Owner's intent to withhold payment until satisfaction of the Claim. If Contractor fails to resolve a Claim or provide a bond to protect Owner against such Claim within thirty (30) days after written notice, Owner shall have the right to make payment on such Claim out of funds due or to become due Contractor. If no such funds are available, Contractor shall indemnify Owner for all amounts Owner has in good faith paid in discharging any Claim, including any associated costs and expenses (including attorneys' fees).

7. **Responsibilities of Contractor**. Contractor agrees to:

A. Provide the Work described in this Contract for the Project in accordance with this Contract and all Construction Documents incorporated herein.

(i) The Contractor remains directly responsible to the State of Wyoming under this Contract for any and all work performed through a subcontractor, and for assuring its own and all subcontractors' compliance with the applicable requirements under IX. B, C, D, E and X of the referenced Consent Decree (Civil No. 92-CV0230) dated October 2, 1992, and any other applicable federal, state, and local laws and regulations. If Contractor's or its subcontractor's acts or omissions violate the applicable requirements of the Consent Decree, laws, or regulations, the Contractor shall bear all costs attributable to the State, including reasonable attorneys' fees.

B. **Construction Schedules**. Contractor, within ten (10) days of receipt of the Notice to Proceed and prior to the approval of any pay applications, shall prepare and submit to Owner and Professional Service Provider a Contractor's Construction Schedule for the Work (Original Baseline Schedule). The Original Baseline Schedule shall not exceed time limits specified by the Contract and shall provide for expeditious and practicable execution of the Work. Contractor shall preserve a copy of the Original Baseline Schedule for Owner's reference.

(i) Contractor shall provide an updated Construction Schedule monthly (Progress Schedule) for Owner approval. The Progress Schedule shall, as much as possible, conform to the Original Baseline Schedule.

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(ii) Contractor shall prepare and keep current, for Professional Service Provider's and Owner's approval, a schedule of submittals which is coordinated with Contractor's Progress Schedule and allows Professional Service Provider reasonable time to review submittals.

(iii) Contractor shall carry on the Work and adhere to the most recent approved Progress Schedule during all disputes or disagreements with Owner or Professional Service Provider unless otherwise notified by Owner or if Contractor is permitted by the provisions of this Contract to stop the Work.

(iv) If, in the opinion of Owner, Contractor is not proceeding with the Work as scheduled and falls significantly behind the most recent approved Progress Schedule, Owner may require Contractor, without additional cost to Owner, to:

(a) Increase the number of shifts;

(b) Initiate or increase overtime operations, increase the number of work days in the week;

(c) Increase the number of construction personnel; or

(d) Submit for approval a Recovery Schedule detailing the specific operational changes to be instituted to regain the most recent approved Progress Schedule.

C. **Supervision**. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract. Contractor shall be solely responsible for its means, methods, techniques, sequences, and procedures of construction, except to the extent that specific means, method, technique, sequence, or procedure of construction are shown or indicated in and either expressly required or forbidden by the Contract. Contractor shall ensure that the completed Work complies with the Contract.

D. **Labor and Working Hours**. Contractor shall provide suitably qualified, competent personnel to complete the Work as required by the Contract. Contractor shall at all times maintain good discipline and order at the Site. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract, all Work at the Site shall be performed during regular working hours, and Contractor will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld), unless otherwise required by the Progress Schedule, Contract, or Owner under Paragraph 7.B(iv).

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E. **Services, Materials, and Equipment**. Until final acceptance of the Work, Contractor shall have the charge, care, and sole responsibility of the Work, including any materials and equipment, and shall bear the risk of injury or damage to any part thereof by the action of any party, the elements, or other cause. Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work. All materials and equipment incorporated into the Work shall be as specified in the Contract or, if not specified, shall be new and of good quality. Contractor shall bear all expenses to restore all Work that is damaged or destroyed prior to Owner's occupation of the Work. All warranties and guarantees specifically called for by the Contract shall expressly run to the benefit of Owner. If required by Professional Service Provider, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable supplier, except as otherwise may be provided in the Contract.

F. **Substitutes**. Requests for substitutions must comply with the Construction Documents.

G. **Subcontractors, Suppliers, and Others**.

(i) Contractor shall not contract with any subcontractor, supplier, or other individual or entity, as a replacement, against whom Owner has reasonable objection. Contractor shall not be required to employ any subcontractor, supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

(ii) Contractor hereby certifies that, as of the Effective Date, it has not entered into any subcontract for any of the Work contemplated under this Contract without prior written authorization of Owner. The Contractor shall ensure that all subcontracts entered into after the Effective Date conform with this Contract and shall provide to each subcontractor a copy of this Contract.

(iii) Contractor shall identify all subcontractors, suppliers, or other individuals or entities in advance for acceptance by Owner. Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents) of any such subcontractor, supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected subcontractor, supplier, or other individual or entity; the Contract Sum shall be adjusted by the difference in the cost occasioned by such replacement;

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and an appropriate Change Order or Amendment shall be executed. No acceptance by Owner of any such subcontractor, supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Professional Service Provider to reject defective Work.

(iv) Substitution and New Subcontractors: Contractor shall not at any time substitute any subcontractor in place of any subcontractor previously listed without the prior written permission of Owner and Professional Service Provider. Contractor shall also inform Owner and Professional Service Provider of its use of any additional subcontractor not previously listed or identified. Contractor shall not contract with a subcontractor against whom a reasonable objection has been made.

(v) Contractor shall be fully responsible to Owner and Professional Service Provider for all acts and omissions of the subcontractors, suppliers, and other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract shall create for the benefit of any such subcontractor, supplier, or other individual or entity any contractual relationship between Owner or Professional Service Provider and any such subcontractor, supplier or other individual or entity. Nothing in the Contract shall create any obligation on the part of Owner or Professional Service Provider to pay or to see to the payment of any monies due any such subcontractor, supplier, or other individual or entity except as may otherwise be required by laws and regulations.

(vi) Contractor shall be solely responsible for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

(vii) Contractor shall require all subcontractors, suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Professional Service Provider through Contractor.

(viii) The divisions and sections of the Construction Documents shall not restrict Contractor in dividing the Work among subcontractors or suppliers or delineating the Work to be performed by any specific trade.

(ix) All Work performed for Contractor by a subcontractor or supplier shall be pursuant to an appropriate agreement between Contractor and the subcontractor or supplier which specifically binds the subcontractor or supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Professional Service Provider. Contractor shall make copies of this Contract available to each proposed subcontractor or supplier prior to the execution of the subcontract.

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(x) Contractor shall comply with the provisions of Wyo. Stats. §§ 16-6-116 and 117, and verify any amount due to or claims made by subcontractors against Contractor. Contractor shall, upon Owner's request and within thirty (30) days, provide to Owner the executed subcontractor lien releases for the period specified in the request.

(xi) In conformity with Wyo. Stat. § 16-6-103, if Contractor bid the Project as a resident Contractor, Contractor shall not subcontract more than thirty percent (30%) of the Work to nonresident subcontractors. Contractor shall comply with all other resident and other preference requirements, including but not limited to those applicable to labor and materials.

H. **Permits and Utility Connections**. Contractor shall provide to Owner all construction permits required of Contractor prior to the commencement of the Work. The cost of all local, state, or federal permits and related inspections is the responsibility of Contractor at all times. Contractor shall give all notices and pay all fees necessary or proper to be given or paid in connection with the performance of the Contract, and obtain and pay for all necessary permits, approvals, licenses, and inspections. Before Final Payment, Contractor shall deliver to Owner all licenses, permits, and certifications obtained in accordance with this Section.

I. **Use of Site and Other Areas**. Contractor shall afford Professional Service Provider, Owner, and any separate contractors reasonable Site access and opportunity for introduction, storage, or staging of their materials and equipment, and performance of their activities.

(i) Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by laws and regulations and approved by Owner, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to the Site or to any other area, Owner or the occupant thereof, or any adjacent land or areas resulting from its or its subcontractors' performance of the Work.

(ii) Should any claim be made by Owner or the owner or occupant of any adjacent land or other areas used in accordance with this Subsection because of the performance of the Work, Contractor shall promptly resolve such dispute with the other party.

(iii) Contractor shall neither load nor permit any part of any structure to be loaded in any manner that will endanger any structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

J. **Record Documents**. Contractor shall maintain, in a safe place at the Site, one (1) record copy of all Contract and written interpretations and clarifications in good

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order and annotated to show changes made to the Project during construction in the format preferred by Owner. Contractor shall update these documents on a daily basis. These record documents together with all approved samples and a counterpart of all approved documents shall be made available to Professional Service Provider and Owner for reference at any time upon request.

K. Review of Contract and Field Conditions by Contractor.

(i) Before starting each portion of the Work, Contractor shall carefully study the Contract, including the Construction Documents relevant to that portion of the Work, as well as the information furnished by Owner; shall take field measurements of any existing conditions related to that portion of the Work; and shall observe any conditions at the Site that potentially will affect the Work. These obligations are for the purpose of facilitating construction by Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract; however, Contractor shall promptly report any errors, inconsistencies, omissions, or conditions inconsistent with the Construction Documents discovered to Professional Service Provider and Owner in such form as Professional Service Provider may require.

(ii) Any design errors or omissions noted by Contractor during this review shall be reported promptly to Professional Service Provider and Owner, but it is recognized that Contractor's review is made in Contractor's capacity as a contractor and not as a licensed Professional Service Provider, unless otherwise specifically provided in the Contract. Contractor is not required to ascertain that the Construction Documents are in accordance with applicable laws and regulations, but Contractor shall promptly report any nonconformity discovered by or made known to Contractor to Professional Service Provider and Owner. In the event Contractor knows or reasonably should have known of an error, inconsistency, or omission in the Construction Documents and fails to inform Professional Service Provider and Owner, Contractor shall pay such costs and damages to Owner as would have been avoided if Contractor had notified Professional Service Provider and Owner.

(iii) If Contractor believes that additional cost or time is involved because of clarifications or instructions issued by Professional Service Provider in response to Contractor's notices or requests for information pursuant to this Section, Contractor shall request direction from Professional Service Provider and Owner. If Contractor fails to perform these obligations, Contractor shall pay such costs and damages to Owner as would have been avoided if Contractor had performed such obligations. Contractor shall not be liable to Owner or Professional Service Provider for damages resulting from errors, inconsistencies, or omissions in the Construction Documents or for differences between field measurements or conditions and the Construction Documents unless Contractor recognized, or in the exercise of

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due diligence should have recognized, such error, inconsistency, omission, or difference and knowingly failed to report it to Professional Service Provider and Owner.

(iv) Contractor shall review for compliance with the Contract, approve and submit to Professional Service Provider all Shop Drawings, Product Data, Samples, and similar required submittals (Submittals). All Submittals shall be made with reasonable promptness and in such sequence as to cause no delay in the Work, the duties of its subcontractors, the activities of Owner, or any activities of separate contractors. Submittals which are not marked as reviewed for compliance with the Contract and approved by Contractor may be returned by Professional Service Provider for resubmittal.

(v) By submitting Submittals, Contractor represents that it has determined and verified materials, field measurements and field construction criteria, or will do so, and checked and coordinated the information contained within Submittals with the requirements of the Work and Contract.

(vi) Contractor shall not perform any portion of the Work for which the Contract requires submission and review of Submittals until the required Submittal has been approved by Professional Service Provider. Contractor shall be solely liable for any Work performed prior to such approval, and shall not be entitled to include such work on an Application for Payment.

(vii) The Work shall be performed in accordance with approved Submittals, except that Contractor shall not be relieved of responsibility for deviations from requirements of the Contract by Professional Service Provider's approval of Submittals unless Contractor has specifically informed Professional Service Provider in writing of such deviation at the time of submission and a Change Order or Construction Change Directive has been issued authorizing the deviation. Contractor shall not be relieved of responsibility for errors or omissions in Submittals by Professional Service Provider's approval thereof.

(viii) Contractor shall, in writing or on resubmitted Submittals, direct specific attention to revisions other than those requested by Professional Service Provider on previous Submittals. In the absence of such written notice, Professional Service Provider's approval of a resubmission shall not apply to such revisions.

(ix) In the event design services are necessary in addition to those provided by Professional Service Provider, the following provisions shall apply:

(a) Contractor shall not be required to provide professional services which constitute the practice of architecture or engineering unless Contractor has the necessary professional licensure to carry out the required professional services and unless such services are

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specifically required by the Contract for a portion of the Work or Contractor needs to provide such services in order to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

(b) If professional design services or certifications by Contractor's design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract, Owner and Professional Service Provider shall specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all plans, calculations, specifications, certifications, Shop Drawings, and other Submittals prepared by such professional.

(c) Shop Drawings and other Submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Professional Service Provider. Owner and Professional Service Provider shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Professional Service Provider have specified to Contractor all performance and design criteria that such services must satisfy.

(d) Professional Service Provider shall review, approve, or take other appropriate action on Submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract.

(x) By executing this Contract, Contractor represents that it has visited the Site, including all locations affected; viewed patent conditions; familiarized itself with the local conditions under which the Work is to be performed; and compared observations with the requirements of the Contract, including the Construction Documents. Contractor shall not be excused from performance on the basis of any open and obvious Site condition. Failure to make careful observations of existing conditions at the Site will not result in issuance of a Change Order or Construction Change Directive. If, however, during the course of the Work, Contractor encounters concealed or latent conditions below the surface of the ground or in an existing structure which are (1) at variance with or materially different from the conditions indicated by the Contract, or (2) of a nature not ordinarily

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encountered or inherent in the Work of the character provided for in this Contract, the Contract Sum and Contract Time may be adjusted by amendment to this Contract.

L. **Performance and Labor and Material Payment Bonds**. If, during the Contract Time, Change Orders or Construction Change Directives increase the Contract Sum, Contractor shall furnish to the State additional bonding coverage as required by Wyo. Stat. § 9-2-3004(c)(iv)(C), so that a bond of one hundred percent (100%) of the Contract Sum is always provided.

M. **Cutting and Patching**. Contractor shall be responsible for any cutting, fitting, or patching required to complete the Work or to make its parts fit together properly.

(i) Contractor shall not cut or otherwise alter such construction by Owner or a separate contractor except with written consent of Owner and of such separate contractor, which consent shall not be unreasonably withheld. Contractor shall not unreasonably withhold from Owner or a separate contractor Contractor's consent to cutting or otherwise altering the Work.

(ii) Contractor shall not damage or endanger a portion of the Work or any fully or partially completed construction of Owner or any separate contractors through cutting, patching, otherwise altering such construction, or by excavation.

N. **Cleanup**. Contractor shall, at all times, keep the Site free from accumulation of waste materials or rubbish caused by operations.

(i) Prior to Substantial Completion of the Work, Contractor shall clean the Site and make it ready for utilization by Owner. At the completion of the Work, Contractor shall dispose of all waste materials and rubbish, remove all tools, appliances, equipment, machinery, materials, and supplies, and restore to original condition all property not designated for alteration by the Contract. Contractor shall dispose of all waste and rubbish in accordance with all applicable laws.

(ii) If Contractor fails to clean up during or at the completion of the Work, Owner may issue a Change Order deducting from the payments due to Contractor the cost of correcting the problem, and, if the payments are not sufficient to cover the cost, Contractor shall pay the difference to Owner.

O. **Safety and Protection**. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.

(i) Contractor agrees that if, in the performance of this Contract, it becomes necessary, convenient, or advisable for Contractor to remove, replace, or interfere with any safety device or controls installed by Owner or another

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contractor, Contractor shall notify and obtain the written authorization from Owner to remove, replace, or interfere with such safety device or controls. Contractor will replace or restore such devices or controls at its own expense as soon as possible to maintain the effectiveness of such safety device or control, and not less than on a daily basis. In the event that safety devices or controls are not replaced or restored, Contractor agrees to reimburse Owner for any expenses Owner incurs in doing so. ("Safety devices or controls" are defined as handrails, temporary fencing, barricades, traffic control devices, signage, and all like objects and devices employed for safety purposes during the Work.).

(ii) Contractor shall set up, arrange, coordinate, and obtain all inspections for their work, as required by any authorized Owner or applicable authority having jurisdiction. Arrangements for the inspection of any area, system, or equipment needing testing or inspection prior to being covered up must be made by Contractor in sufficient time to allow for inspection. Contractor shall not cover up any area until the inspections are complete.

(iii) Contractor shall take all necessary precautions to ensure the safety of and provide suitable protections to prevent damage, injury, or loss to:

(a) All persons on the Site or who may be affected by the Work;

(b) All the Work, including materials and equipment to be incorporated into the Work, whether in storage on or off the Site; and

(c) Other property at the Site or other areas adjacent to the Site, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of the Work.

(iv) Contractor shall hold weekly safety meetings and, as required by Owner, provide reports of the topics discussed to Owner. Contractor shall make available, upon request of Owner, evidence of not less than weekly scheduled safety inspections performed by qualified personnel for the duration of the Project.

(v) Contractor shall be solely responsible for the health and safety of its employees, agents, subcontractors, suppliers, and representatives. In addition, Contractor shall take all necessary and prudent safety precautions with respect to the Work and shall fully and timely comply with all safety programs initiated by Owner, as well as with all applicable laws, ordinances, rules, permits, regulations, and orders of any public authority for the safety of persons or property. Owner is not responsible in any manner for the safety of Contractor's work or its employees, agents, subcontractors, suppliers, or representatives.

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(vi) If Contractor fails to correct any procedures, acts, or conditions which Owner or any public authority believes are unsafe within an eight (8) hour period of written notification by Owner or any public authority, Owner may correct the unsafe procedure, act, or condition and deduct from Contractor's payment an amount equal to all costs, direct and indirect, for the correction and remediation. This specifically includes, but is not limited to, the cleanup of construction debris and the replacement or installation of railings or barricades. Contractor's repeated failures to timely and satisfactorily correct unsafe procedures, acts, or conditions as set forth in this Paragraph upon notice from Owner and any public authorities shall constitute a material breach upon which Owner may terminate this Contract without any additional notice to Contractor.

P. Contractor's Cooperation and Supervision of Work.

(i) Contractor shall be supplied with two (2) paper and one (1) electronic copy of the Contract, including plans and specifications, and shall keep one (1) hard copy set available at the Site at all times.

(ii) Contractor shall provide sufficient labor to perform the Work. If Contractor fails to provide sufficient labor force, Owner may give Contractor written notice, instructing Contractor to correct the problem within a time period specified in the notice. If the problem has not been corrected within the time specified in the notice, Owner may exercise its Remedies under this Contract as outlined in Section 6.

(iii) Contractor shall be responsible for the acts and omissions of its employees, agents, subcontractors, suppliers, representatives, and any other persons performing any of the Work under a contract with Contractor. Contractor shall not employ or permit subcontractors to employ on the Project any unfit person or anyone unskilled in the work assigned. Contractor shall take appropriate action to remove any employee, subcontractor, supplier, agent, or representative found to be unfit or unskilled in the work assigned to that person from performing duties. Contractor shall at all times enforce strict discipline and good order among its employees and Subcontractors' employees and shall ensure such employees exhibit appropriate professional behavior. As part of that responsibility, Contractor shall enforce Owner's alcohol-free, drug-free, tobacco-free, harassment-free, and weapon-free policies and zones, and ensure compliance with those policies and zones by Contractor's employees, agents, subcontractors, suppliers, representatives, and all other persons carrying out this Contract. Owner may direct Contractor to promptly remove any person who does not comply with this provision from the Site for the duration of the Contract.

Q. Site Security Identification. Contractor shall require all construction workers, whether Contractor's own employees or Contractor's subcontractors, to wear

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identification tags on the front of their persons during all times while on Owner's property. Such identification tags shall contain a current photograph and the worker's full name in a typeface large enough to be seen from a reasonable distance. [**Instruction:** Delete this Subsection Q if not applicable.]

8. Responsibilities of Owner.

A. Payment. Owner shall pay Contractor in accordance with Section 5, above.

B. Communications with Contractor. Except as otherwise provided herein, Owner shall issue all communications to Contractor through Professional Service Provider and Owner's Designee. Owner shall not give instructions or orders directly to Contractor's employees or to Contractor's subcontractors or material suppliers unless such persons are designated as authorized representatives of Contractor.

(i) Owner shall promptly make available to Contractor information that affects this Contract and that becomes available to Owner after execution of this Contract.

(ii) If Owner becomes aware of any code or safety issues at the Site, Owner shall give written notice to Contractor in sufficient detail and with sufficient time to permit Contractor to take appropriate action to correct the identified issue.

C. Information Required of Owner. If available, upon Contractor's request, Owner shall provide the legal description and allow access to all surveys in Owner's possession describing the physical characteristics, easements, and utility locations for the Site. Information or services under Owner's control shall be furnished by Owner with reasonable promptness to avoid delay in the orderly progress of the Work.

D. Replacement of Professional Service Provider. In case of termination of Professional Service Provider's agreement with Owner, Owner shall appoint a Professional Service Provider to whom Contractor makes no reasonable objection and who shall assume the status of the former Professional Service Provider under the Contract.

E. Schedule Coordination for Work Performed by Owner. Owner shall work with Contractor in scheduling and performing the Work of the Project being performed by Owner or others, to avoid conflicts or interference in Contractor's Work.

F. Modifications. Owner shall have the discretion, through Professional Service Provider or Owner's Designee, to initiate Modifications. Modifications include:

(i) Major or Significant Changes. Such changes shall be made by written Change Order to this Contract and shall be binding on Contractor. Contractor shall carry out such Change Orders promptly.

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(ii) Minor Changes. Owner and Professional Service Provider shall have authority to order minor changes in the Work that do not involve an adjustment in the Contract Sum or an extension of the Contract Time and that are otherwise consistent with the intent of the Contract. Such changes shall be made at the request of the Contractor and upon written approval of the Owner, which shall be binding on Contractor. Contractor shall carry out such changes promptly.

9. Special Provisions.

A. Assumption of Risk. The Contractor shall assume the risk of any loss of state or federal funding, either administrative or program dollars, due to the Contractor's failure to comply with state or federal requirements and shall be financially responsible for such lost funding. The Owner shall notify the Contractor of any state or federal requirements that may impact the funding of the Project and any determination of noncompliance. Contractor shall also, and does, hereby assume the responsibility for damage to its Work and materials resulting from all risks of physical loss or damage, prior to the completion and acceptance of its Work. Contractor shall, at its own cost and expense, repair or replace any part of the Work or materials damaged or destroyed and obtain insurance to pay for the cost of making any such replacement or repair. Nothing in this provision shall be construed to relieve Contractor of full responsibility for the risk of injury, loss, or damage to materials not yet incorporated in the Work, and to materials, tools, and equipment used to perform the Work.

B. Contracts Are Complementary. What is required by one part of the Contract shall be binding as if required by all. Anything mentioned in the specifications and not shown on the plans, or shown on the plans and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both.

C. Equipment. Owner's equipment shall be available to Contractor only at Owner's discretion and on mutually satisfactory terms.

D. Substantial Completion. Substantial Completion, as defined in Wyo. Stat. § 1-3-110, is the stage in the progress of the Work when the Project or a designated portion thereof is sufficiently complete in accordance with the Contract so that Owner can occupy or utilize the Project for its intended use. For the purposes of this Contract, full or partial occupancy or use of the facility by Owner shall not, in and of itself, constitute or be sufficient for determining Substantial Completion.

(i) All of the following, if applicable, are prerequisites required for Substantial Completion:

(a) Inspection, approval, occupancy, and other permits have been issued by regulatory agencies having jurisdiction and without conditions. Conditional permits do not satisfy Substantial Completion requirements;

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(b) All building systems are in place, complete, functional, have been fully started and tested, and finally accepted by the Professional Service Provider. The HVAC system shall be tested and balanced with a preliminary balance report submitted to, and accepted by the Professional Service Provider or Owner, or all of them;

(c) Odor and fume generating activities are complete;

(d) Contractor has submitted draft submittal of Operation and Maintenance (O&M) manuals, the Professional Service Provider has accepted the draft, and Contractor has completed O&M training necessary for the Owner's personnel to maintain operation and occupancy of the facility. Contractor remains liable and responsible for any damage to systems or equipment until Owner receives this information and training; and

(e) The Owner is able to fully occupy and utilize all portions of the Work for its intended use.

(ii) When the Contractor considers that the Work, or a portion thereof that Owner agrees to accept separately, is substantially complete, Contractor shall prepare and submit to the Professional Service Provider and Owner a comprehensive list of items to be completed or corrected prior to Final Payment (Punch List).

(a) Upon receipt of the Contractor's Punch List, the Professional Service Provider and Owner shall make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the inspection discloses any item, whether or not included on the Punch List, which is not substantially complete in accordance with the Contract so that Owner can occupy or utilize the Work or designated portion thereof for its intended use, Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Professional Service Provider or Owner. In such case, the Contractor shall then submit a request for another inspection by the Professional Service Provider and Owner to determine Substantial Completion.

(b) Contractor shall not receive a Certificate of Substantial Completion unless remaining Punch List items do not represent a hazard or create an adverse impact to the Owner and occupants before the Contractor, its subcontractors, or both complete those items.

(c) Failure to include an item on the Punch List does not relieve Contractor of its responsibility to complete all work in accordance with the Contract.

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(iii) When the Work or designated portion thereof is substantially complete, Owner shall direct the Professional Service Provider to prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and fix the time within which the Contractor shall finish all items on the Punch List accompanying the Certificate. Warranties required by the Contract shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

(a) Following receipt of the Certificate of Substantial Completion by both Owner and Contractor, both parties shall provide written acceptance of their respective responsibilities. Contractor shall notify the Surety. Upon further acceptance and consent of Surety, Owner shall make payment of retainage applying to such work or designated portion thereof. Such payment shall be adjusted for work that is incomplete or not in accordance with the requirements of the Contract.

E. **Occupancy Before Substantial Completion**. Owner reserves the right, at its option and convenience, to occupy or otherwise make use of all or any part of the Site at any time before Substantial Completion, upon ten (10) days written notice to Contractor. Occupancy shall be subject to the following conditions:

(i) Owner shall use its best efforts to prevent its occupancy from interfering with the performance of Contractor's remaining Work.

(ii) Contractor shall not be required to repair damage if the damage is caused by Owner's occupancy or use, unless such damage was caused by a condition which Contractor was or should have been aware of and that Contractor failed to disclose.

(iii) The warranty period for those portions of the Site occupied and equipment utilized by Owner shall start as of the date of actual occupancy or use by Owner.

(iv) Occupancy or use shall not constitute acceptance by Owner as to either the completed Work or any portion thereof, nor shall it relieve Contractor from full responsibility for correcting defective Work or materials found before final completion and acceptance of all the Work or during the warranty period(s) specified in Subsection 9.V.

F. **Occupancy as of Substantial Completion**. Owner may, at its sole discretion, occupy the Site as of the date of Substantial Completion. Occupancy shall be subject to the following conditions:

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(i) Occupancy or use shall not constitute acceptance by Owner either of the completed Work or any portion thereof, nor shall it relieve Contractor from full responsibility for correcting defective Work or materials found before final completion and acceptance of all the Work or during the warranty period specified in Subsection 9.W.

(ii) Contractor shall not be required to repair damage if the damage was caused by Owner's occupancy or use, unless such damage was caused by a condition which Contractor was or should have been aware of and that Contractor failed to disclose.

(iii) The period of any special warranties required by the Contract for equipment shall start as of the date of occupancy or use by Owner.

G. Correction of Work Before Final Payment.

(i) All Work which does not conform to the requirements of the Contract, or which was unauthorized, will be considered unacceptable, and Owner may order such Work to be removed and replaced in an acceptable manner, at Contractor's expense, as determined by Professional Service Provider or Owner. Upon receipt of written notice of such a determination, Contractor shall promptly, and in no case longer than thirty (30) days after receipt, correct all Work that is rejected by Professional Service Provider or Owner or fails to conform to the Contract requirements, whether such defect is observed before or after Substantial Completion, and whether or not the Work is fabricated, installed, or completed. Contractor shall bear all costs of correcting such rejected Work, including additional testing and inspections and compensation for additional services and expenses by Professional Service Provider and Owner.

(ii) If Contractor fails to comply with an order to correct defective Work, Owner may issue a Stop Work Order, have unauthorized or unacceptable Work removed, at Contractor's expense, and deduct from any monies due or that become due to Contractor all costs of removal and correction. Contractor shall bear the cost of correcting destroyed or damaged Work of Owner or Owner's separate contractors caused by Contractor's correction or remediation under this provision.

(iii) If Owner prefers to accept defective or nonconforming Work, it may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate. Such reduction shall be made whether or not Final Payment has been made, and Owner may condition its acceptance of nonconforming Work upon Contractor's agreement to a longer warranty period for the nonconforming Work.

H. Correction of Work After Final Payment.

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(i) Contractor shall, within a reasonable time, but in no case longer than thirty (30) days after receipt of written notice thereof, repair any defects in materials or workmanship, and replace any defective material, or correct any Work not done in accordance with the Contract, which may be discovered within the warranty period, and repair any damage resulting from the repair or replacement of such defects. Such repair and remediation shall be done at Contractor's expense and without cost to Owner. In the event Contractor fails to remedy any such defect within a reasonable time, which in no case shall be longer than thirty (30) days after receipt of such written notice, Owner may remedy such defect itself or proceed to have such defect remedied at Contractor's expense. Contractor shall pay all costs and charges accruing for such Work and any other damages sustained by Owner. Contractor shall bear the costs of correcting destroyed or damaged Work that its correction or removal of Work under this provision causes to the Work of Owner or Owner's separate contractors.

(ii) Nothing contained in this provision or in any specific warranty required by the specifications, shall operate to relieve Contractor from responsibility, after expiration of the guarantee or warranty period(s), for damages resulting from latent defects, departures from the requirements of the Contract, fraud, or negligence.

(iii) Nothing in this provision shall be construed to establish a period of limitation with respect to other obligations which Contractor might have under the Contract or at law.

I. Change Orders.

(i) A Change Order is a written amendment to this Contract directing a change in the Work to be performed under the Contract, adjusting the Contract Sum, and/or adjusting the Contract Time, signed by Owner and Professional Service Provider, and provided to Contractor.

(ii) Owner reserves the right to order, in writing, changes in the Contract, alterations or additions to the Work, or omission of portions of the Work at any time prior to acceptance of the project, without voiding the Contract.

(iii) Contractor may submit a Change Order Request; Owner, however, reserves the right to reject any proposed Change Order Request. All Change Order Requests shall be in writing, signed, and provided to Owner and Professional Service Provider. Change Order Requests shall include the reasons for the Request, and clearly state the proposed change in the Work, the sum or length of time requested, or all of the above. A Change Order Request must be made within twenty (20) days after the reason for the Request is discovered. Failure to file a request for a Change Order Request within twenty (20) days constitutes a waiver of any future claim for which a Request could have been made.

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(iv) Upon receipt of a written Change Order Request from Contractor, Owner and Professional Service Provider, shall determine, within ten (10) days after receipt of the Request, whether a Change Order shall be issued. If a Change Order is issued, it shall be in writing, signed, and provided to Contractor no later than ten (10) days after receipt of the request. If a Change Order is not issued, Owner shall, no later than ten (10) days after receipt of its Request, notify Contractor of the denial and the reason(s) why it has denied Contractor's Request.

(v) Changed work shall be performed in accordance with the original Contract requirements, to the extent those requirements do not conflict with the Change Order.

(vi) Any change or deviation from the Contract without written authorization will be at Contractor's own risk for which no payment, on a quantum meruit basis or otherwise, shall be made. Contractor expressly waives all equitable claims it might bring and any right to equitable remedies it might seek related to disputes related to Work performed under this Contract.

(vii) Within forty-eight (48) hours after receipt of a denial of a Change Order Request or receipt of a Change Order from Owner, Contractor may object to the denial of a Change Order or state any objection it has to a Change Order. Disposition of all objections shall be in accordance with Subsection 9.K.

(viii) Maximum Markup Percentage Allowable on Self-Performed Work. With respect to pricing Change Orders, the maximum Markup Percentage Fee to be paid to any Contractor on self-performed work shall be a single markup percentage not to exceed fifteen percent (15%) of the net direct cost of:

(a) Direct labor and allowable labor burden costs applicable to the Change Order or extra work;

(b) The net cost of material and installed equipment incorporated into the Change Order or extra work; and

(c) The net rental cost of major equipment and related fuel costs necessary to complete the change in the Work.

(ix) Maximum Markup Percentages Allowable on Work Performed by Lower Tier Contractors. With respect to pricing the portion of change order proposals involving work performed by lower tier contractors, the maximum Markup Percentage Fee allowable to Contractor supervising the lower tier Contractor's work shall not exceed five percent (5%) of the net of all approved change order work performed by all subcontractors. The combined total of maximum Markup Percentage Fee by Contractor and lower tier contractors shall not exceed fifteen percent (15%).

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(x) No Markup on Bonds and Liability Insurance Costs. Change Order cost adjustments due to increases or decreases in bond or insurance costs (if applicable) shall not be subject to any Markup Percentage Fee.

(xi) Direct and Indirect Costs Covered by Markup Percentages. The agreed upon Markup Percentage Fee shall cover Contractor's profit and all indirect costs associated with the change order work. Items to be covered by the Markup Percentage Fee include, but are not limited to: home office expenses, branch office and field office overhead expense of any kind; project management; superintendents, general foremen; non-working foremen, estimating, engineering; coordinating; expediting; purchasing; detailing; legal, accounting, data processing or other administrative expenses; Shop Drawings; permits; auto insurance and umbrella insurance; pick-up truck costs; and warranty expense costs. The cost for the use of small tools shall also be considered covered by the Markup Percentage Fee. Small tools shall be defined as tools and equipment (power or non-power) with an individual purchase cost of less than seven hundred fifty dollars ($750.00).

(xii) Deductive Change Orders and Net Deductive Changes. The application of the markup percentages referenced in the Paragraphs 9.I(viii) and 9.I(ix) above will apply to both additive and deductive change orders. In the case of a deductive change order, the credit shall be computed by applying the sliding scale percentages as outlined in Paragraphs 9.I(viii) and 9.I(ix) so that a deductive change order would be computed in the same manner as an additive change order. In those instances where a change involves both additive and deductive work, the additions and deductions will be netted and the markup percentage adjustments will be applied to the net amount.

(xiii) Field Orders. Owner may authorize a written or unwritten field order for changes or alterations in the Work that do not involve changes in the unit rates or the Contract Sum and are not inconsistent with the overall intent of the Contract. Alterations which change the character of the Work or materially change the unit costs of the Work shall require a written Change Order signed by Owner and Professional Service Provider.

J. Delays and Extensions of Time/Force Majeure. Neither party shall be liable for failure to perform under this Contract if such failure to perform arises out of causes beyond the control and without the fault or negligence of the nonperforming party. Such causes may include, but are not limited to, acts of God or the public enemy, fires, floods, epidemics, quarantine restrictions, and freight embargoes. This provision shall become effective only if the party failing to perform immediately notifies the other party of the extent and nature of the problem, limits delay in performance to that required by the event, and takes all reasonable steps to minimize delays.

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(i) Contractor shall consider and include within the Contract Sum the climatic conditions of the location of the Project that may delay the Work. Contractor shall not be granted an extension of Contract Time or amendment of the Contract or Contract Sum for the additional cost of the Project due to a delay in the Work resulting in whole or in part from adverse weather conditions.

(ii) Where Contractor is prevented from completing any part of the Work within the Contract Time due to delay beyond the control of Contractor for reasons other than adverse weather conditions, Contractor may be granted an extension of Contract Time and/or amendment of the Contract Sum for additional cost of the Project as provided in this Contract.

(iii) Any Change Order Request for extension of time arising out of an event covered under Paragraph 9.J(ii) shall be made in writing to Owner and Professional Service Provider within twenty (20) days after commencement of the delay; otherwise it shall be waived. Such a Change Order Request shall detail the additional time needed resulting from the delay. Owner and Professional Service Provider shall approve only that time reasonably attributed to events covered under Paragraph 9.J(ii). The value of this time shall be calculated by taking the [value of general conditions divided by the number of work days]. [**Guidance:** Agency or Agency's designee may remove this calculation if it is determined that a negotiated method will be used for change order requests. Remove this section and unhighlight prior to finalizing the contract.]

(iv) Contractor understands and agrees that no verbal approval of time extension by Owner, Owner's Designee, or other agents of Owner (including the Professional Service Provider), either express or implied, shall be binding upon Owner unless and until such approval is expressly ratified in writing by Owner.

K. **Dispute Procedure**. In seeking to resolve any dispute relating to this Contract, Owner expressly reserves its immunity as set forth in Subsection 10.V.

(i) Disputes Prior to Final Completion.

(a) In the event of a dispute arising between Contractor and Owner, Owner shall interpret the requirements of the Contract and the performance hereunder. If a dispute exists, Contractor shall notify Owner in writing within seven (7) days, providing the details of the dispute. Owner shall, within ten (10) days, interpret the Contract, and notify Contractor in writing whether or not it is entitled to the requested or other remedy regarding the dispute.

(b) If Contractor is dissatisfied with the determination of Owner, it may, within five (5) days of receiving notice of the determination, request a partnering session. The parties shall have twenty (20) days from

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the date of the request for the partnering session to discuss and attempt to resolve the dispute. Upon resolution of the issue, a resolution agreement shall be developed by Owner, distributed to both parties, and incorporated into this Contract as an amendment, keeping all of the other original terms and conditions of the Contract intact.

(c) If the dispute is not resolved within the twenty (20) day time period provided for a partnering session, Contractor may, within seven (7) days, request non-binding mediation, make a modified or amended request for a further partnering session based on the outcome of the first, or notify Owner in writing of any changes to the details of the dispute with Owner. If Contractor opts to renew the partnering session or to change the details of the dispute, the process shall begin again in accordance with the preceding paragraphs. Non-binding mediation shall occur only upon mutual agreement of the parties, and shall be procedurally accomplished in accordance with the Wyoming Supreme Court's Rules for Civil Procedure, Rule 40. Owner and Contractor shall jointly select a mediator. The parties to the dispute shall bear their respective costs for the mediation. The mediator may give an oral or, if requested, written, non-binding determination of the dispute.

(d) At the conclusion of the non-binding mediation, the parties may enter into a settlement to be incorporated into the Contract based on the mediator's determination. If either party disagrees with the proposed determination of the mediator and no settlement is pending, Owner's last determination on the issue shall be binding.

(e) At any time during the dispute resolution, Owner may implement the Stop Work Provision, Owner's Right to Perform provision, or other provisions of this Contract.

(ii) Disputes Following Final Completion. The parties may by mutual agreement attempt to settle disputes through non-binding mediation. Any non-binding mediation conducted pursuant to this Paragraph shall be held in Wyoming in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect, unless the parties mutually agree otherwise. A request for non-binding mediation by one party shall be submitted in writing to the other party to this Contract. Any demand for non-binding mediation shall be made after the dispute has arisen. In no event shall the demand for non-binding mediation be made after the date when institution of legal or equitable proceedings based upon such claim, dispute, or other matter in question would be barred by the applicable statute of limitations.

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L. **Emergencies**. In the event of an emergency affecting the safety of persons or property, Contractor shall take all necessary and proper steps to prevent damage or injury to persons and property. Contractor shall make every reasonable effort to immediately communicate with Owner concerning the emergency. The inability of Contractor to establish communication with Owner will not relieve Contractor of the responsibility to mitigate injury or damage to persons or property.

M. **Kickbacks**. Contractor certifies and warrants that no gratuities, kickbacks, or contingency fees were paid in connection with this Contract, nor were any fees, commissions, gifts, or other considerations made contingent upon the award of this Contract. If Contractor breaches or violates this warranty, Owner may, at its discretion, terminate this Contract without liability to Owner, or deduct from the Contract Sum or consideration, or otherwise recover, the full amount of any commission, percentage, brokerage, or contingency fee per Wyo. Stat. § 9-2-1032.

N. **Limitations on Lobbying Activities**. By signing this Contract, Contractor certifies and agrees that, in accordance with P.L. 101-121, payments made from a federal grant shall not be utilized by Contractor or its subcontractors in connection with lobbying member(s) of Congress, or any federal agency in connection with the award of a federal grant, contract, cooperative agreement, or loan.

O. **Liquidated Damages**. If Contractor fails to complete the Work within the time specified in the Contract or within any authorized extension of time under a Change Order, Contractor shall pay to Owner liquidated damages for each day of delay until the Work is completed or accepted. The parties agree that the liquidated damages described below are a fair, reasonable, and appropriate estimate of Owner's foreseeable damages and are not intended as a penalty.

(i) Liquidated damages shall amount to totals based on the following schedule:

Contract Range	Daily Liquidated Damages Charge
$0.00 - $500,000	$ 250.00
$500,001 - $1,000,000	$ 500.00
$1,000,001 - $2,000,000	$ 750.00
$2,000,001 - $3,000,000	$ 1,000.00
$3,000,001 - $5,000,000	$ 1,250.00
$5,000,001 - $7,500,000	$ 1,500.00
$7,500,001 - $10,000,000	$ 1,750.00

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$10,000,001 - $15,000,000	$	2,000.00
$15,000,001 - $20,000,000	$	2,250.00
$20,000,001 and Greater	$	2,500.00

(ii) Liquidated damages shall be computed beginning the day following the first calendar day specified for Substantial Completion and shall accrue each calendar day until Substantial Completion is achieved. Upon Substantial Completion, Contractor shall have thirty (30) days to achieve Final Completion. If Final Completion is not achieved within that time period, liquidated damages shall begin to accrue again on the thirty-first (31st) day from Substantial Completion.

(iii) Liquidated damages shall not be charged for any work required to be done by Contractor as a result of a final inspection, providing the work is only cleanup or of a minor nature and Contractor has shown constant effort in completing the Work, as determined by Owner and Professional Service Provider. If deferment of the inspection is necessary due to causes which Owner, in its sole discretion, determines to be beyond the control of and without the fault or negligence of Contractor, liquidated damages shall not be assessed for that period of time.

(iv) Liquidated damages shall be collected by executing a Deductive Change Order reducing the Final Payment by the amount due in damages. In the event the Final Payment is not sufficient to cover the accrued liquidated damages, Contractor shall remain liable for the remainder of the accrued liquidated damages.

P. **Monitoring Activities**. Owner shall have the right to monitor all activities related to this Contract that are performed by Contractor or its subcontractors. This shall include, but not be limited to, the right to make Site inspections at any time and with reasonable notice; to bring experts and consultants on Site to examine or evaluate completed work or work in progress; to examine the books, ledgers, documents, papers, and records pertinent to this Contract; and to observe personnel in every phase of performance of Contract related work.

Q. **Nondiscrimination**. Contractor shall comply with the Civil Rights Act of 1964, the Wyoming Fair Employment Practices Act (Wyo. Stat. § 27-9-105, *et seq.*), the Americans with Disabilities Act (ADA), 42 U.S.C. § 12101, *et seq.*, and the Age Discrimination Act of 1975 and any properly promulgated rules and regulations thereto and shall not discriminate against any individual on the grounds of age, sex, color, race, religion, national origin, or disability in connection with its performance under this Contract. Federal Law requires Contractor to include all relevant special provisions of this Contract in every subcontract awarded in excess of ten thousand dollars ($10,000.00) so that such provisions are binding on each subcontractor.

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R. **Nonresident Contractors**. Wyo. Stat. § 17-16-1501 provides that nonresident corporations must be registered with the Wyoming Secretary of State's Office to conduct business in Wyoming. Wyo. Stat. § 27-1-106(a) provides that firms, corporations or employers of any kind who are nonresident employers may be required to provide bonds to the Wyoming Department of Workforce Services. Contractor agrees to abide by these provisions, as applicable, and to contact the Wyoming Department of Workforce Services to obtain proof that it is in good standing with both its Unemployment Tax Division and Worker's Safety and Compensation Division and to provide such proof to Owner upon request.

S. **Owner's Right to Perform and Stop Work**.

(i) If Contractor defaults or fails to perform the Work in accordance with the Contract, and fails within twenty (20) days after receipt of written notice from Owner to commence and continue correction of such default or failure to perform with diligence and promptness, Owner may issue a Stop Work Order to make good such deficiencies, or both, until the cause for such order has been eliminated. In such case, an appropriate Change Order shall be issued deducting from the payments due Contractor the cost of correcting all deficiencies. However, this right to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor or any other person or entity.

(ii) If it becomes necessary for Owner to take over the completion of any part of the Contract, all of the amounts owing Contractor, including the withheld retainage, shall first be applied toward the cost of completion of the Contract, as provided in Wyo. Stat. § 16-6-703. If the payments due Contractor are not sufficient to cover such amount, Contractor shall remain liable to Owner for the remainder.

T. **Payroll Records**. Contractor, and all subcontractors, shall follow Wyo. Stat. § 27-4-410 and keep, or cause to be kept, an accurate payroll record showing the name, address, Social Security number and classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each employee employed in connection with the Work. The payroll record shall be certified and shall be available for inspection by the Wyoming Department of Workforce Services or Owner at all reasonable hours at the principal office of Contractor. Copies of payroll records shall be furnished to the Wyoming Department of Workforce Services or Owner, upon request. Owner shall reimburse Contractor for the cost of reproduction.

U. **Required Resident Labor.** Contractor agrees to comply with the requirements of Wyo. Stat. §16-6-203 for any "Laborers" (as defined in Wyo. Stat. §16-6-202 (a)(i)) employed to perform work under this Contract. Contractor understands that failure to comply with the Required Resident Labor Statute is punishable pursuant to Wyo. Stat. §16-6-206. Unless otherwise provided in the Contract, the Contractor shall

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provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent. The Contractor shall comply with all resident and other preference requirements, including but not limited to those applicable to labor, materials and subcontractors.

V. Shop Drawings, Product Data and Samples.

(i) Product Data consists of illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by Contractor to illustrate materials or equipment for some portion of the Work.

(ii) Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

(iii) Shop Drawings are drawings created by Contractor, or a subcontractor, supplier, manufacturer, or other entity that illustrate construction, materials, dimensions, installation, and other pertinent information for the incorporation of an element or item into the Work.

(iv) Shop Drawings, Product Data, Samples and similar submittals are not part of this Contract unless specifically incorporated in Subsection 10.K. The purpose of those types of submittals is to demonstrate compliance with Contract. Professional Service Provider shall respond to these submittals as required by the Contract. Submittals which are not required by the Contract may be returned by Professional Service Provider without action.

W. Warranties. Contractor warrants to Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise specified, required, or permitted by the Contract, that the Work will be free from defects, and that the Work will conform to the requirements of the Contract.

(i) Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and unacceptable. Contractor shall replace all such defective and unacceptable materials and equipment at Contractor's expense.

(ii) If required by Professional Service Provider or Owner, Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

(iii) The warranty period relates only to the specific obligation of Contractor to correct the Work and has no relationship to the time within which the obligation to comply with the Contract may be enforced. The warranty period is not limited to the time within which proceedings may be

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commenced to establish Contractor's liability with respect to Contractor's obligations, other than specifically to correct the Work. The warranty period is twelve (12) months beginning upon Substantial Completion and survives termination of the Contract under Subsection 10.X. In the event a defect is discovered and remedied under this Subparagraph, the warranty period shall run for twelve (12) months from the date the defect was remedied to the satisfaction of Owner.

(iv) Contractor's warranty excludes defects or damage caused by abuse, modification, or improper maintenance or operation by persons other than Contractor, subcontractors, suppliers, or any other individual or entity for whom Contractor is responsible; or normal wear and tear under normal usage.

X. **Work Acceptance**. Contractor's obligation to perform and complete the Work in accordance with the Contract shall be absolute. None of the following shall constitute an acceptance of Work that is not in accordance with the Contract or a release of Contractor's obligation to perform the Work in accordance with the Contract:

(i) Observations by Professional Service Provider;

(ii) Recommendation by Professional Service Provider or payment by Owner of any Progress or Final Payment;

(iii) Any review and approval of a Shop Drawing or Submittal or the issuance of a notice of acceptability by Professional Service Provider;

(iv) The issuance of a Certificate of Substantial Completion by Professional Service Provider or any related payment by Owner;

(v) Use or occupancy of the Work or any part thereof by Owner;

(vi) Any inspection, test, or approval by others; or

(vii) Any correction of defective Work by Owner.

Y. [Instruction: include in all Contracts except where Owner is a school district pursuant to a project managed by the Wyoming State Construction Department, School Facilities Division.] **Wage and Hour Provisions**. Pursuant to the Wyoming Prevailing Wage Act of 1967, Wyo. Stats. §§ 27-4-401 through -413, Contractor shall pay not less than the prevailing hourly rate of wages for work to all workers and ensure that subcontractors do likewise with their employees.

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10. General Provisions.

A. Amendments. Any changes, modifications, revisions, or amendments to this Contract, except Construction Change Directives, which are mutually agreed upon by the parties to this Contract shall be incorporated by written instrument, executed by all parties to this Contract.

B. Applicable Law, Rules of Construction, and Venue. The construction, interpretation, and enforcement of this Contract shall be governed by the laws of the State of Wyoming, without regard to conflicts of law principles. The terms "hereof," "hereunder," "herein," and words of similar import, are intended to refer to this Contract as a whole and not to any particular provision or part. The Courts of the State of Wyoming shall have jurisdiction over this Contract and the parties. The venue shall be the First Judicial District, Laramie County, Wyoming.

C. Assignment Prohibited and Contract Shall Not be Used as Collateral. Neither party shall assign or otherwise transfer any of the rights or delegate any of the duties set out in this Contract without the prior written consent of the other party. Contractor shall not use this Contract, or any portion thereof, for collateral for any financial obligation without the prior written permission of Owner.

D. Audit and Access to Records. Owner and its representatives shall have access to any books, documents, papers, electronic data, and records of Contractor which are pertinent to this Contract. [**Instruction**: Use the following Additional Optional Language in cases where an independent audit is required. Consult your agency's assistant attorney general regarding additional language which is needed to address special requirements. Remember to delete this instruction and remove italics.] *Contractor shall immediately, upon receiving written instruction from Owner, provide to any independent auditor or accountant all books, documents, papers, electronic data, and records of Contractor which are pertinent to this Contract. Contractor shall cooperate fully with any such independent auditor or accountant during the entire course of any audit authorized by Owner.*

E. Availability of Funds. Each payment obligation of Owner is conditioned upon the availability of government funds which are appropriated or allocated for the payment of this obligation and which may be limited for any reason including, but not limited to, congressional, legislative, gubernatorial, or administrative action. If funds are not allocated and available for continued performance of the Contract, the Contract may be terminated by Owner at the end of the period for which the funds are available. Owner shall notify Contractor at the earliest possible time of the services which will or may be affected by a shortage of funds. No penalty shall accrue to Owner in the event this provision is exercised, and Owner shall not be obligated or liable for any future payments due or for any damages as a result of termination under this Section.

F. Award of Related Contracts. Owner may award supplemental or successor contracts for work related to this Contract or may award contracts to other

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contractors for work related to this Contract. Contractor shall cooperate fully with other contractors and Owner in all such cases.

G. **Certificate of Good Standing**. Contractor shall provide to the Agency a Certificate of Good Standing from the Wyoming Secretary of State, or other proof that Contractor is authorized to conduct business in the State of Wyoming, if required, before performing work under this Contract. Contractor shall ensure that all annual filings and corporate taxes due and owing to the Secretary of State's office are up-to-date before signing this Contract.

H. **Compliance with Laws**. Contractor shall keep informed of and comply with all applicable federal, state and local laws and regulations, and all federal grant requirements and executive orders in the performance of this Contract.

I. **Confidentiality of Information**. All documents, data compilations, reports, computer programs, photographs, data, and other work provided to or produced by Contractor in the performance of this Contract shall be kept confidential by Contractor unless written permission is granted by Owner for its release. If and when Contractor receives a request for information subject to this Contract, Contractor shall notify Owner within ten (10) days of such request and shall not release such information to a third party unless directed to do so by Owner.

J. **Counterparts**. This Contract may be executed in counterparts. Each counterpart, when executed and delivered, shall be deemed an original and all counterparts together shall constitute one and the same Contract. Delivery by Contractor of an originally signed counterpart of this Contract by facsimile or PDF shall be followed up immediately by delivery of the originally signed counterpart to Owner. Contractor's failure to deliver, either personally or via US Mail, postage prepaid, the originally signed counterpart to Owner within seven (7) days shall be considered a material breach and may result in immediate termination of this Contract by Owner.

K. **Entirety of Contract**. This Contract, consisting of [Insert number of pages, for example, "fourteen (14)"] _____ (___) pages; Attachment A, [Title of document], consisting of _____ (___) page(s); and Attachment B, [Title of document], consisting of _____ (___) page(s)] [make sure to list all Construction Documents as defined in 4.B in this provision]; and any modifications agreed upon between the parties subsequent to the Effective Date of this Contract, represent the entire and integrated Contract between the parties and supersede all prior negotiations, representations, and agreements, whether written or oral.

(i) With regard to the General Provisions of this Contract, in the event of conflict or inconsistency between the language of Section 10, General Provisions, of this Contract and the language of any attachment or document incorporated by reference, the language of Section 10 shall control.

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(ii) With regard to the project specifications, in the event of conflict or inconsistency, Contractor shall presume, in the following order, that:

(a) The language in the most recent modification shall control;

(b) The most stringent requirements apply; and

(c) Specialized specifications shall take precedence over standard specifications.

(iii) Should Contractor be unable to determine which conflicting requirements are binding after application of the above principles, Contractor shall seek clarification from Owner as soon as possible.

L. **Indemnification**. Contractor shall release, indemnify, and hold harmless the State, Owner, and their officers, agents, and employees from any and all claims, suits, liabilities, court awards, damages, costs, attorneys' fees, and expenses arising out of Contractor's failure to perform any of Contractor's duties and obligations hereunder or in connection with the negligent performance of Contractor's duties or obligations, including, but not limited to, any claims, suits, liabilities, court awards, damages, costs, attorneys' fees, and expenses arising out of Contractor's negligence or other tortious conduct.

M. **Independent Contractor**. Contractor shall function as an independent contractor for the purposes of this Contract and shall not be considered an employee of the State of Wyoming for any purpose. Consistent with the express terms of this Contract, Contractor shall be free from control or direction over the details of the performance of services under this Contract. Contractor shall assume sole responsibility for any debts or liabilities that may be incurred by Contractor in fulfilling the terms of this Contract and shall be solely responsible for the payment of all federal, state, and local taxes which may accrue because of this Contract. Nothing in this Contract shall be interpreted as authorizing Contractor or its agents or employees to act as an agent or representative for or on behalf of the State of Wyoming or Owner or to incur any obligation of any kind on behalf of the State of Wyoming or Owner. Contractor agrees that no health or hospitalization benefits, workers' compensation, unemployment insurance, or similar benefits available to State of Wyoming employees will inure to the benefit of Contractor or Contractor's agents or employees as a result of this Contract. Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with laws and regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract.

N. **Notices**. All notices arising out of, or from, the provisions of this Contract shall be in writing either by electronic mail, regular mail or delivery in person at the

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addresses provided under this Contract. Any change of address must be provided in writing to both parties.

O. **Notice of Sale or Transfer**. Contractor shall provide Owner with notice of any sale, transfer, merger, or consolidation of the assets of Contractor. Such notice shall be provided in accordance with the notices provision of this Contract and, when possible and lawful, in advance of the transaction. If Owner determines that the sale, transfer, merger, or consolidation is not consistent with the continued satisfactory performance of Contractor's obligations under this Contract, then Owner may, at its discretion, terminate or renegotiate the Contract.

P. **Ownership and Return of Documents and Information**. [Option One: for Non-Government Contractors such as a private firm. Remove this note and italics when an option is selected.] *Owner is the official custodian and owns all documents, data compilations, reports, computer programs, photographs, data, and other work provided to or produced by the Contractor in the performance of this Contract. Upon termination of services, for any reason, Contractor agrees to return all such original and derivative information and documents to Owner in a useable format. In the case of electronic transmission, such transmission shall be secured. The return of information by any other means shall be by a parcel service that utilizes tracking numbers. Upon Owner's verified receipt of such information, Contractor agrees to physically and electronically destroy any residual Owner-owned data, regardless of format, and any other storage media or areas containing such information. Contractor agrees to provide written notice to Owner confirming the destruction of any such residual Owner-owned data.*[Option Two: for Government Contractor Option such as the University of Wyoming, counties or any federal entities. Remove this note and italics when an option is selected.] *Owner is the official custodian and owns all documents, data compilations, reports, computer programs, photographs, data, and other work provided to or produced by the Contractor in the performance of this Contract. Upon termination of services, for any reason, Contractor agrees to return all such original and derivative information and documents to Owner in a useable format. In the case of electronic transmission, such transmission shall be secured. The return of information by any other means shall be by a parcel service that utilizes tracking numbers.*

Q. **Ownership of Materials**. Except where progress payments have been made for the invoiced value of acceptable materials delivered to the Site but not yet incorporated in the Work immediately upon the performance of any part of the Work, as between Contractor and Owner, title thereto shall vest in Owner; provided, however, the vesting of such title shall not impose any obligations on Owner or relieve Contractor of any of its obligations hereunder.

R. **Insurance Requirements**.

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(i) During the term of this Contract, Contractor shall obtain and maintain, and ensure that each subcontractor obtains and maintains, each type of insurance coverage specified in Insurance Coverage, below.

(ii) All policies shall be primary over any insurance or self-insurance program carried by Contractor or the State of Wyoming. All policies shall include clauses stating that each insurance carrier shall waive all rights of recovery under subrogation or otherwise against Contractor or the State, its agencies, institutions, organizations, officers, agents, employees, and volunteers.

(iii) Contractor shall provide Certificates of Insurance to Owner verifying each type of coverage required herein. If the policy is a "claims made" policy instead of an "occurrence" policy, the information provided shall include, but is not limited to, retroactive dates and extended reporting periods or tails.

(iv) All policies shall be endorsed to provide at least thirty (30) days advance written notice of cancellation to Owner. A copy of the policy endorsement shall be provided with the Certificate of Insurance.

(v) In case of a breach of any provision relating to Insurance Requirements or Insurance Coverage, Owner may, at Owner's option, obtain and maintain, at the expense of Contractor, such insurance in the name of Contractor, or subcontractor, as Owner may deem proper and may deduct the cost of obtaining and maintaining such insurance from any sums which may be due or become due to Contractor under this Contract.

(vi) All policies required by this Contract shall be issued by an insurance company with an A.M. Best rating of A- VIII or better.

(vii) Owner reserves the right to reject any policy issued by an insurance company that does not meet these requirements.

S. Insurance Coverage. Contractor shall obtain and maintain the following insurance in accordance with the Insurance Requirements set forth above:

(i) Commercial General Liability Insurance. Commercial general liability insurance (CGL) coverage, occurrence form, covering liability claims for bodily injury and property damage arising out of premises, operations, products and completed operations, and personal and advertising injury, with minimum limits as follows:

(a) $1,000,000.00 each occurrence;

(b) $1,000,000.00 personal injury and advertising injury;

(c) $2,000,000.00 general aggregate; and

SAMPLE CONTRACT SUBJECT TO CHANGE

(d) $2,000,000.00 products and completed operations.

The CGL policy shall include coverage for Explosion, Collapse and Underground property damage. This coverage may not be excluded by endorsement.

(ii) Workers' Compensation and Employer's Liability Insurance. Employees hired in Wyoming to perform work under this Contract shall be covered by workers' compensation coverage obtained through the Wyoming Department of Workforce Services' workers' compensation program, if statutorily required. Employees brought into Wyoming from Contractor's home state to perform work under this Contract shall be covered by workers' compensation coverage obtained through the Wyoming Department of Workforce Services' workers' compensation program or other state or private workers' compensation insurance approved by the Wyoming Department of Workforce Services, if statutorily required. Contractor shall provide Owner with a Certificate of Good Standing or other proof of workers' compensation coverage for all of its employees who are to perform work under this Contract, if such coverage is required by law. If workers' compensation coverage is obtained by Contractor through the Wyoming Department of Workforce Services' workers' compensation program, Contractor shall also obtain Employer's Liability "Stop Gap" coverage through an endorsement to the CGL policy required by this Contract, with minimum limits as follows:

(iii) Unemployment Insurance. Contractor shall be duly registered with the Department of Workforce Services and obtain such unemployment insurance coverage as required. Contractor shall supply Owner with a Certificate of Good Standing or other proof of unemployment insurance coverage.

(iv) Automobile Liability Insurance. Automobile liability insurance covering any auto (including owned, hired, and non-owned) with minimum limits of $1,000,000.00 each accident combined single limit.

(v) [**Instruction:** Can be removed if contractor is not providing any Professional Services (Architect, Engineer, Survey)] Professional Liability or Errors and Omissions Liability Insurance. Professional liability insurance or errors and omissions liability insurance protecting against any and all claims arising from Contractor's alleged or real professional errors, omissions, or mistakes in the performance of professional duties under this Contract, with minimum limits as follows:

(a) $1,000,000.00 each occurrence; and

(b) $1,000,000.00 general aggregate.

SAMPLE CONTRACT SUBJECT TO CHANGE

The policy shall have an extended reporting period of two (2) years.

T. **Prior Approval**. This Contract shall not be binding upon either party, no services shall be performed, and the Wyoming State Auditor shall not draw warrants for payment, until this Contract has been fully executed, approved as to form by the Office of the Attorney General, filed with and approved by the State Construction Department, and approved by the Governor of the State of Wyoming, or his designee, if required by Wyo. Stat. § 9-2-3204(b)(iv).

U. **Severability**. Should any portion of this Contract be judicially determined to be illegal or unenforceable, the remainder of this Contract shall continue in full force and effect, and the parties may renegotiate the terms affected by the severance.

V. **Sovereign Immunity and Limitations**. Pursuant to Wyo. Stat. § 1-39-104(a), the State of Wyoming and Owner expressly reserve sovereign immunity by entering into this Contract and specifically retain all immunities and defenses available to them as sovereigns. The parties acknowledge that the State of Wyoming has sovereign immunity and only the Wyoming Legislature has the power to waive sovereign immunity. [The following italicized portion should be added if the Contractor is attaching any of its own terms and conditions to the Contract. It can otherwise be deleted.] *The parties further acknowledge that there are constitutional and statutory limitations on the authority of the State of Wyoming and its agencies or instrumentalities to agree to certain terms and conditions supplied by Contractor, including, but not limited to, the following: liability for damages; choice of law; conflicts of law; venue and forum-selection clauses; defense or control of litigation or settlement; liability for acts or omissions of third parties; payment of attorneys' fees or costs; additional insured provisions; dispute resolution, including, but not limited to, arbitration; indemnification of another party; and confidentiality. Any such provisions in the Contract, or in any attachments or documents incorporated by reference, will not be binding on the State of Wyoming.* [The remaining sentences are mandatory.] Designations of venue, choice of law, enforcement actions, and similar provisions shall not be construed as a waiver of sovereign immunity. The parties agree that any ambiguity in this Contract shall not be strictly construed, either against or for either party, except that any ambiguity as to sovereign immunity shall be construed in favor of sovereign immunity.

W. **Taxes**. Contractor shall pay all taxes and other such amounts required by federal, state and local law, including, but not limited to federal and social security taxes, workers' compensation, unemployment insurance and sales taxes.

X. **Termination of Contract**. In addition to any other provisions contained herein, this Contract may be terminated, without cause, by Owner upon thirty (30) days written notice. Owner may terminate this Contract immediately for cause if Contractor fails to perform in accordance with the terms and conditions of this Contract. Should Contractor fail to perform in a manner consistent with the terms

SAMPLE CONTRACT
SUBJECT TO CHANGE

and conditions set forth in this Contract, payment under this Contract may be withheld until such time as Contractor performs its duties and responsibilities. If at any time during the performance of this Contract, in the opinion of Owner, the Work is not progressing satisfactorily or within the terms of the Contract, then at the discretion of Owner and after written notice to Contractor, Owner may terminate this Contract or any part of it. At this termination date, Contractor will be entitled to a pro rata payment for all work accomplished and all construction-ready materials provided and accepted by Owner and all finished documents, data, models and reports prepared under the Contract shall, at the option of Owner, become its property upon payment for services rendered through the termination of the Contract.

Y. **Third-Party Beneficiary Rights**. The parties do not intend to create in any other individual or entity the status of third-party beneficiary, and this Contract shall not be construed so as to create such status. The rights, duties and obligations contained in this Contract shall operate only between the parties to this Contract, and shall inure solely to the benefit of the parties to this Contract. The provisions of this Contract are intended only to assist the parties in determining and performing their obligations under this Contract.

Z. **Time is of the Essence**. Time is of the essence with regard to all deadlines of this Contract.

AA. **Titles Not Controlling**. Titles of sections and subsections are for reference only, and shall not be used to construe the language in this Contract.

BB. **Waiver**. The waiver of any breach of any term or condition in this Contract shall not be deemed a waiver of any prior or subsequent breach. Failure to object to a breach shall not constitute a waiver.

THE REMAINDER OF THIS PAGE WAS INTENTIONALLY LEFT BLANK

SAMPLE CONTRACT
SUBJECT TO CHANGE

11. **Signatures**. The parties to this Contract, either personally or through their duly authorized representatives, have executed this Contract on the dates set out below, and certify that they have read, understood, and agreed to the terms and conditions of this Contract.

The Effective Date of this Contract is the date of the signature last affixed to this page.

[STATE OF WYOMING/SCHOOL DISTRICT/AGENCY]

[Contact Name], [Contact Title]	Date
[Contact Name], [Contact Title]	Date

CONTRACTOR

[Contact Name], [Contact Title] [Company Name]	Date

ATTORNEY GENERAL'S OFFICE: APPROVAL AS TO FORM [Instructions: Remove if not applicable**]**

[Contact Name], [Senior] Assistant Attorney General	Date

SAMPLE CONTRACT SUBJECT TO CHANGE

2025 Building Construction Prevailing Wages

Statewide (All Counties)

Code No.	Craft	Basic Hourly Rate	Method	Hourly Fringe Benefit	Method
2000	Mechanical, Heat and Frost Insulation	$25.50	3	$2.63	3
2050	Asbestos Removal, Abatement, Demolition	$23.00	2	$0.00	1
2100	Boilermaker	$38.42	4	$32.82	4
2200	Bricklayers and Masons	$32.87	1	$14.52	1
2300	Carpenters and Joiners	$29.05	3	$5.48	3
2400	Electricians	$35.17	4	$14.33	4
2500	Elevator Constructors	$56.57	4	$41.83	4
2600	Iron Workers	$33.68	2	$12.69	3
2700	General Laborers - Group I	$22.77	3	$2.68	3
2800	Semi-Skilled Laborers - Group II	$25.40	3	$2.68	4
3000	Tenders - Group IV	$25.40	4	$3.99	3
4000	Millwright Machinery Workers	$40.19	4	$20.79	4
4100	Operating Engineers - Group I	$30.68	3	$7.61	3
4200	Operating Engineers - Group II	$30.68	4	$7.61	4
4300	Operating Engineers - Group III	$30.68	4	$7.61	4
4400	Operating Engineers - Group IV	$30.68	4	$7.61	4
4500	Operating Engineers - Group V	$30.68	4	$7.61	4
4600	Operating Engineers - Group VI	$41.25	3	$9.91	3
4700	Operating Engineers - Group VII	$41.25	4	$9.91	4
5000	Painters and Allied Trades	$27.12	3	$0.00	1
5050	Sheetrock and Drywall Installers	$29.76	3	$5.16	3
5100	Carpet, Linoleum and Resilient Tile Layers	$40.00	1	$0.00	1
5200	Fire Sprinkler Installers	$35.69	3	$9.36	3
5250	Fire System Installers (non-water)	$31.77	3	$7.05	3
5300	Plumbers and Pipe fitters	$36.94	3	$9.49	3
5400	Roofers	$22.77	3	$0.00	1
5500	Sheet Metal Workers	$31.20	3	$6.59	3
5600	Cement Masons/Plasterers	$28.00	2	$4.20	3
5700	Glaziers	$24.62	3	$4.64	3
5750	Blinds/Window-covering Installer	$11.96	4	$0.00	4
5800	Marble, Tile, and Terrazzo Setters	$36.00	1	$12.00	1
6000	Teamsters - Group I	$25.96	3	$3.83	3
6100	Teamsters - Group II	$29.64	3	$9.22	3
6200	Limited Electricians (90 Volt or Less)	$32.62	3	$6.43	3

Notes:

Methods

1 **Majority**. If 50% of workers or more within a labor group earn the same wage/fringe benefit, this becomes the prevailing wage/fringe benefit benefit for the labor group in the respective district. If two different wages/benefits each account for 50% for a labor group within a district, a weighted average is performed.

2 **Significant Minority**. If 30% of workers or more within a labor group earn the same wage, this becomes the prevailing wage for the labor group in the respective district. If two different wages each account for 30% for a labor group within a district, a weighted average is performed. This method is not used for benefits.

3 **Weighted Average**. If no significant minority exists for a wage/fringe benefit, the prevailing wage/fringe benefit is calculated as {[(Total Hourly Wage or Fringe Benefit)/(Number of Workers)] + [(Total Wages Or Benefits Paid)/(Hours Worked)]}/2.

4 **Other Adjustments.** If no data is received by the survey for a particular classification an inflation adjustment is applied based on the previous year wage and benefit according to rules and regulations of the Department of Workforce Services.

If 30% or more of reported workers and hours were party to a collective bargaining agreement (CBA), the current CBA wage/benefits rates were used (as long as Method 1 does not apply).

If 50% or more of workers and/or hours were reported with benefits, benefits are computed using Method 3.

Highlighted sections indicate trades where skill adjustment may be necessary to ensure higher skilled positions pay at least equal to lower skilled occupations.

		2025 Heavy and Highway Prevailing Wages including Statewide (all Counties) Wages															
		Statewide (All Counties)				Statewide excluding Laramie and Natrona Counties (Region 3)				Laramie County (Region 2)				Natrona County (Region 1)			
Code No.	Craft	Basic Hourly Rate	Method	Hourly Fringe Benefit	Method	Basic Hourly Rate	Method	Hourly Fringe Benefit	Method	Basic Hourly Rate	Method	Hourly Fringe Benefit	Method	Basic Hourly Rate	Method	Hourly Fringe Benefit	Method
101	Laborers: Group I	$21.80	3	$0.00	1	$21.68	3	$0.00	1	$22.55	3	$3.75	3	$20.99	3	$4.08	3
102	Laborers: Group 2	$23.04	3	$4.57	3	$22.90	3	$4.08	3	$24.15	3	$5.72	3	$22.25	3	$5.56	3
103	Laborers: Group 3	$26.00	3	$8.52	3	$24.50	3	$6.52	3	$28.46	3	$10.70	3	$31.05	1	$11.25	1
201	Truck Drivers: Group 1	$25.96	3	$4.38	3	$26.01	3	$3.69	3	$25.89	3	$10.61	1	$26.48	3	$5.60	3
202	Truck Drivers: Group 2	$27.79	3	$6.50	3	$28.37	3	$5.93	3	$25.89	4	$10.61	4	$28.14	3	$7.20	3
301	Power Equipment Operators: Group 1	$26.92	3	$5.83	3	$26.90	3	$5.13	3	$27.57	3	$7.24	3	$25.00	2	$6.28	3
302	Power Equipment Operators: Group 2	$28.88	3	$8.50	3	$28.56	3	$8.01	3	$31.81	3	$12.32	3	$28.60	3	$7.44	3
303	Power Equipment Operators: Group 3	$32.13	3	$8.58	3	$32.72	3	$8.10	3	$31.81	4	$12.32	4	$30.00	2	$8.56	3
401	Carpenter	$30.95	3	$8.16	3	$29.40	3	$5.25	3	$34.26	3	$13.81	3	$27.07	4	$2.37	4
501	Concrete Finisher	$30.01	3	$8.84	3	$30.12	3	$7.39	3	$29.75	3	$14.21	3	$28.00	1	$7.46	1
601	Ironworker	$46.00	1	$0.00	1	$46.00	1	$0.00	1	$36.94	4	$9.30	4	$35.24	4	$28.33	4
901	Electrician (Inside Wireman, Outside Lineman and Signal and Lighting work)	$58.83	4	$21.89	4	$58.83	4	$21.89	4	$58.83	4	$21.89	4	$58.83	4	$21.89	4
902	Groundman	$34.72	4	$17.64	4	$34.72	4	$17.64	4	$37.59	4	$16.42	4	$34.68	4	$16.91	4
903	Equipment Operator	$48.91	4	$20.61	4	$48.91	4	$20.61	4	$53.39	4	$17.73	4	$48.86	4	$18.79	4

Notes:

Methods:

1 **Majority**. If 50% of workers or more within a labor group earn the same wage/fringe benefit, this becomes the prevailing wage/fringe benefit benefit for the labor group in the respective district. If two different wages/benefits each account for 50% for a labor group within a district, a weighted average is performed.

2 **Significant Minority**. If 30% of workers or more within a labor group earn the same wage, this becomes the prevailing wage for the labor group in the respective district. If two different wages each account for 30% for a labor group within a district, a weighted average is performed. This method is not used for benefits computations.

3 **Weighted Average**. If no significant minority exists for a wage/fringe benefit, the prevailing wage/fringe benefit is calculated as {[(Total Hourly Wage or Fringe Benefit)/(Number of Workers)] + [(Total Wages Or Benefits Paid)/(Hours Worked)]}/2.

4 **Other Adjustments.** If no data is received by the survey for a particular classification an inflation adjustment is applied based on the previous year wage and benefit according to rules and regulations of the Department of Workforce Services.

If 30% or more of reported workers and hours were party to a collective bargaining agreement (CBA), the current CBA wage/benefits rates were used (as long as Method 1 does not apply).

If 50% or more of workers and/or hours were reported with benefits, benefits are computed using Method 3.

Highlighted sections indicate trades where skill adjustment may be necessary to ensure higher skilled positions pay at least equal to lower skilled occupations.

CHANGE ORDER

OWNER ☐
ARCHITECT ☐
CONSULTANT ☐
FIELD ☐
OTHER ☐

PROJECT:

CHANGE ORDER NUMBER: One (1)

DATE:

TO CONTRACTOR:

ARCHITECT'S PROJECT NO:

CONTRACT DATE:

CONTRACT FOR:

[Remove if not necessary]

As per attached [title of document], dated _____ and consisting of _____ (___) page(s), the Contract is changed as follows:

[Insert , for example, "Add to Scope of Work:" or "Add days to Substantial

	$	0.00
	$	0.00
	$	0.00
Total	$	0.00

Not valid until signed by the Owner and Contractor.

The original Contract Sum was	$	-
Net change by previously authorized Change Orders	$	-
The Contract Sum prior to this Change Order was	$	-
The Contract Sum will be [increased or decreased] by this Change Order in the amount of	$	-
The new (Contract Sum) (Guaranteed Maximum Price) including this Change Order will be	$	-

The Contract Time will be changed / extended by . . . . . 0 Work or Calendar Days

The new Substantial Completion date is . . . . . .

ARCHITECT	CONTRACTOR	OWNER
BY:	BY:	BY:
DATE	DATE	DATE

AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:
(Name, legal status and address)

SURETY:
(Name, legal status and principal place of business)

OWNER:
(Name, legal status and address)

BOND AMOUNT: $

PROJECT:
(Name, location or address, and Project number, if any)

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

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User Notes: (1245069639)

Signed and sealed this day of ,

(Contractor as Principal)	*(Seal)*
(Witness)	*(Title)*
(Surety)	*(Seal)*
(Witness)	*(Title)*

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User Notes: (1245069639)

AIA® Document G702™ – 1992

Application and Certificate for Payment

TO OWNER:

PROJECT:

APPLICATION NO: 001
PERIOD TO:
CONTRACT FOR:
CONTRACT DATE:
PROJECT NOS: / /

Distribution to:
OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
FIELD: ☐
OTHER: ☐

FROM CONTRACTOR:

VIA ARCHITECT:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM		$0.00
2. NET CHANGE BY CHANGE ORDERS		$0.00
3. CONTRACT SUM TO DATE (Line 1 ± 2)		$0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)		$0.00
5. RETAINAGE:		
a. 0 % of Completed Work (Column D + E on G703)	$0.00	
b. 0 % of Stored Material (Column F on G703)	$0.00	
Total Retainage (Lines 5a + 5b or Total in Column I of G703)		$0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)		$0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)		$0.00
8. CURRENT PAYMENT DUE		$0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	$0.00	

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$0.00	$0.00
Total approved this Month	$0.00	$0.00
TOTALS	$0.00	$0.00
NET CHANGES by Change Order		$0.00

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:

County of:

Subscribed and sworn to before me this day of

Notary Public:

My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED $0.00

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

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User Notes: (3B9ADA4E)

AIA® Document G703™ – 1992

Continuation Sheet

AIA Document, G702™–1992, Application and Certification for Payment, or G736™–2009, Project Application and Project Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
In tabulations below, amounts are in US dollars.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:	001
APPLICATION DATE:	
PERIOD TO:	
ARCHITECT'S PROJECT NO:	

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D + E + F)	% (G ÷C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD					
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00
	GRAND TOTAL	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**0.00%**	**$0.00**	**$0.00**

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User Notes: (3B9ADA55)

Contractor's Affidavit (see attached form)

must be submitted with every Pay Application

CONTRACTOR'S AFFIDAVIT
SWORN STATEMENT FOR PROGRESS PAYMENT NO. _____
PURSUANT TO WYOMING STATUTE § 16-6-1001
AMENDED BY EXECUTIVE ORDER 2011-2

RE: _____
PROJECT TITLE

This statement is submitted by _____ (Contractor) to satisfy Wyoming Statute § 16-6-1001.

I, _____, the authorized representative of the Contractor, hereby certify that all claims for materials and labor performed under the contract for the above-referenced project have been paid through Progress Payment No. _____, less any contracted amounts held for retainage.

If any claim for material and labor is disputed this sworn statement shall so state, and the amount claimed to be due shall be deducted from the progress payment due the Contractor and retained by the State of Wyoming until the determination of the dispute, either by judicial action or consent of the parties, and then paid by the agent or agency to persons found entitled thereto.

Claims for material and labor being disputed are stated as follows (list laborer name and amount due below):

_____

_____

_____

_____
Signature

_____
Title

_____
Date

STATE OF WYOMING)
)
COUNTY OF _____)

The foregoing instrument was subscribed and sworn to before me by _____ who is the _____ of _____ this _____ day of _____, 20____.

Witness my hand and official seal.

_____
Notary Public

My Commission Expires:

State of Wyoming

CONTRACTOR'S AFFIDAVIT AND STATEMENT AS TO PAYMENT AND FINAL SETTLEMENT

_____having been first duly sworn on oath deposes and says:

That all claims for material and labor, performed under a contract for public works heretofore entered into with_____of the State of Wyoming for construction work known as_____Contract Number_____ have been and are paid for the entire period of time for which the final payment is to be made, to wit, commencing_____and ending_____; with the exception of those disputed claims for material or labor hereunder enumerated.

This affidavit is made pursuant to the provisions of Wyo. Stat. § W.S. 16-6-117, 1982 as amended.

_____
Signature

_____
Printed Name of Contractor

_____
Title

ATTEST:

_____
Secretary

STATE OF_____) ss.

COUNTY OF_____)

Subscribed in my presence and sworn to before me this_____day of _____, 20_____.

_____
Notarial Officer (SEAL)

My Commission Expires_____.

ACKNOWLEDGMENT FOR CORPORATION ONLY

STATE OF_____) SS.
COUNTY OF_____)

On this_____day of_____, 20_____, before me appeared _____, to me personally known, who, by my duly sworn and upon oath, represented that he/she is the_____(president or other officer or agent) of the corporation, that the foregoing instrument was signed on behalf of the corporation pursuant to his/her authority to do so, and that the he/she acknowledged the instrument to be the free act and deed of the corporation.

_____
Notarial Officer (SEAL)

My Commission Expires_____.

CHANGE ORDER

OWNER ☐
ARCHITECT ☐
CONSULTANT ☐
FIELD ☐
OTHER ☐

PROJECT:

CHANGE ORDER NUMBER: One (1)

DATE:

TO CONTRACTOR:

ARCHITECT'S PROJECT NO:

CONTRACT DATE:

CONTRACT FOR:

[Remove if not necessary]

As per attached [title of document], dated _____ and consisting of _____ (___) page(s), the Contract is changed as follows:

[Insert , for example, "Add to Scope of Work:" or "Add days to Substantial

	$	0.00
	$	0.00
	$	0.00
Total	$	0.00

Not valid until signed by the Owner and Contractor.

The original Contract Sum was	$	-
Net change by previously authorized Change Orders	$	-
The Contract Sum prior to this Change Order was	$	-
The Contract Sum will be [increased or decreased] by this Change Order in the amount of	$	-
The new (Contract Sum) (Guaranteed Maximum Price) including this Change Order will be	$	-

The Contract Time will be changed / extended by . . . . . 0 Work or Calendar Days

The new Substantial Completion date is . . . . . .

ARCHITECT	CONTRACTOR	OWNER
BY:	BY:	BY:
DATE	DATE	DATE

AIA® Document G704™ – 2017

Certificate of Substantial Completion

PROJECT: *(name and address)*	**CONTRACT INFORMATION:** Contract For: Date:	**CERTIFICATE INFORMATION:** Certificate Number: 001 Date:
OWNER: *(name and address)*	**ARCHITECT:** *(name and address)*	**CONTRACTOR:** *(name and address)*

The Work identified below has been reviewed and found, to the Architect's best knowledge, information, and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated below is the date established by this Certificate.
(Identify the Work, or portion thereof, that is substantially complete.)

ARCHITECT *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE OF SUBSTANTIAL COMPLETION**

WARRANTIES
The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:
(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)

WORK TO BE COMPLETED OR CORRECTED
A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:
(Identify the list of Work to be completed or corrected.)

The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. The Contractor will complete or correct the Work on the list of items attached hereto within ( ) days from the above date of Substantial Completion.

Cost estimate of Work to be completed or corrected: $

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:
(Note: Owner's and Contractor's legal and insurance counsel should review insurance requirements and coverage.)

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

CONTRACTOR *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE**
OWNER *(Firm Name)*	**SIGNATURE**	**PRINTED NAME AND TITLE**	**DATE**

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AIA® Document G706™ – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐ ARCHITECT: ☐
	CONTRACT FOR: General Construction	CONTRACTOR: ☐
TO OWNER: *(Name and address)*	**CONTRACT DATED:**	SURETY: ☐ OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose

Indicate Attachment ☐ Yes ☐ No

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

CONTRACTOR: *(Name and address)*

BY: _____
(Signature of authorized representative)

_____
(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

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AIA® Document G706A™ – 1994

Contractor's Affidavit of Release of Liens

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐
		ARCHITECT: ☐
	CONTRACT FOR: General Construction	CONTRACTOR: ☐
TO OWNER: *(Name and address)*	**CONTRACT DATED:**	SURETY: ☐
		OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.

2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:

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Consent Of Surety to Final Payment

PROJECT: *(Name and address)*	**ARCHITECT'S PROJECT NUMBER:**	OWNER: ☐
	CONTRACT FOR:	ARCHITECT: ☐
TO OWNER: *(Name and address)*	**CONTRACT DATED:**	CONTRACTOR: ☐
		SURETY: ☐
		OTHER: ☐

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(*Insert name and address of Surety*)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

_____
(Surety)

_____
(Signature of authorized representative)

Attest:
(Seal):

_____
(Printed name and title)

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SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Phased construction.
4. Owner-furnished/Contractor-installed (OFCI/OFSI) products.
5. Contractor's use of site and premises.
6. Coordination with occupants.
7. Work restrictions.
8. Specification and Drawing conventions.
9. Miscellaneous provisions.

B. Related Requirements:

1. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
2. Section 01 73 00 "Execution" for coordination of Owner-installed products.

1.3 PROJECT INFORMATION

A. Project Identification:

Aquatic Center Renovation and Addition
for the
State of Wyoming
Wyoming Life Resource Center
Wyoming Department of Health
Lander, Wyoming

B. Project Location: 8204 WY-789,
Lander, WY 82520

C. Project Identification Number:
1. Request for Bid Number: RFB 26-0612
2. Plan One/Architects Project Number 2505

D. Architect Identification: The Contract Documents, dated November 26, 2025, were prepared for Project by Plan One/Architects, 4020 Dewar Drive, Suite A, Rock Springs, Wyoming.

E. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:

1. Structural:
   Plan One/Architects
   225 West Yellowstone, Suite 4
   Cody, Wyoming 82414
   Contact: Jeff Wenke, PE
2. Mechanical, Electrical and Plumbing:
   Associated Construction Engineers
   2040 Harnish Boulevard
   Billings, Montana 59101
   Contact: Logan Grimstad, PE

F. Owner:
   State Of Wyoming
   State Construction Department
   Construction Management Division
   700 West 21st Street
   Cheyenne, Wyoming 82002

1. Owners Representatives:
   a. Agency Representative: Nate Miller
      1) Telephone No. (307) 431-7905
   b. Procurement Representative: Lenora Simpson
      1) Telephone No. (307) 777-3558

G. Project Web Site: A project Web site administered by Contractor will be used for purposes of managing communication and documents during the construction stage.

1. See Section 01 31 00 "Project Management and Coordination." for requirements for establishing administering and using the Project Web site

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:

1. This project, located in the Wyoming Life Resource Center campus, in Lander, Wyoming. Generally, the work included in this project consists of limited renovation of pool area and 1,303 sq ft addition to the mechanical equipment room. Scope of work includes site work, concrete foundations, stud framing with brick veneer, asphalt shingle roof with vent-ed nail base system, gutters and downspouts, h.m. doors and frames, door hardware, high-performance paint systems, gypsum ceilings, mechanical systems relocation and modifications, lighting, and electrical.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.5 PHASED CONSTRUCTION

A. Construct the Work in phases, with each phase substantially complete as indicated on Drawings.

B. Before commencing Work of each phase, submit an updated copy of Contractor's construction schedule, showing the sequence, commencement and completion dates for all phases of the Work.

1.6 WORK PERFORMED BY OWNER

A. Subsequent Work: Owner will perform the following additional work at site after Substantial Completion. Completion of that work will depend on successful completion of preparatory Work under this Contract.
   1. Installation of salvaged vegetation.

1.7 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFCI/OFSI) PRODUCTS

A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:
   1. Provide to Contractor Owner-reviewed Product Data, Shop Drawings, and Samples.
   2. Provide for delivery of Owner-furnished products to Project site.
   3. Upon delivery, inspect, with Contractor present, delivered items.
      a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.
   4. Obtain manufacturer's inspections, service, and warranties.
   5. Inform Contractor of earliest available delivery date for Owner-furnished products.

B. Contractor's Responsibilities: The Work includes the following, as applicable:
   1. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
   2. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
   3. Receive, unload, handle, store, protect, and install Owner-furnished products.
   4. Make building services connections for Owner-furnished products.
   5. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
   6. Repair or replace Owner-furnished products damaged following receipt.

C. Owner-Furnished/Contractor-Installed (OFCI) Products:
   1. Items noted on the drawings.

1.8 CONTRACTOR’S USE OF SITE AND PREMISES

A. Limits on 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. Driveways, Walkways and Entrances: Keep driveways, parking, 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 for 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.

B. 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.

C. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.9 COORDINATION WITH OCCUPANTS

A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.10 WORK RESTRICTIONS

A. Comply with restrictions on construction operations.
1. Comply with limitations on use of public streets, work on public streets, rights of way, 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 9:00 p.m., Monday through Sunday, unless otherwise indicated or as required per local Authorities Having Jurisdiction. In coordination with owner occupancy, some efforts will require work outside normal business working hours of 5 p.m. to 7 a.m.
1. Weekend Hours: Coordinate Weekend work with Owner. Obtain Owner’s written permission before proceeding.
2. Hours for Utility Shutdowns: Coordinate with Owner.

C. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
1. Notify Architect and Owner not less than two days in advance of proposed disruptive operations.
2. Hours for Core Drilling, Concrete Jackhammering, concrete sawing, steel cutting, and miscellaneous noisy activities: Obtain Owner's written permission before proceeding with disruptive operations.

D. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging for temporary utility services according to requirements indicated:

1. Notify Architect and Owner's Representative not less than two days in advance of proposed utility interruptions.
2. Obtain Owner's Representative written permission before proceeding with utility interruptions.

A. Smoking and Controlled Substance Restrictions: Use of tobacco products, electronic cigarettes, alcoholic beverages, and other controlled substances on Project site is not permitted.

B. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

C. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.

1. Maintain list of approved screened personnel with Owner's representative.

1.11 SPECIFICATION FORMATS AND CONVENTIONS

A. Specification Format: The specifications are organized into divisions and sections using the 36-division format and CSI/CSC's "Master Format" numbering system.

1. Section Identification: The specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.
2. Division 1: Sections in Division 1 govern the execution of the work of all sections in the specifications.

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

1. Abbreviated Language: Language used in the specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Imperative mood and streamlined language are generally used in the specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the section text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

B. Drawing Format: The drawings amongst themselves are considered additive and comprehensive. If a scope item occurs on one drawing, it may not occur on every drawing, but it is still part of the entire project and is included in the scope of work.

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 scheduled on Drawings and published as part of the U.S. National CAD Standard.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.
4. Drawing Format: The drawings amongst themselves are considered additive and comprehensive. If a scope item occurs on one drawing, it may not occur on every drawing, but it is still part of the entire project and is included in the scope of work.

D. Drawing and Specification Format: The drawings and specifications in relation to each other are considered additive and comprehensive. If a scope item occurs on the drawings, it may not occur in the specifications (and vice versa), but it is still part of the entire project and is included in the scope of work.

PART 2 - PRODUCTS (Not Used).

PART 3 - EXECUTION (Not Used).

END OF SECTION 01 10 00

SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Contingency allowances.

C. Related Requirements:

1. Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Section 01 40 00 "Quality Requirements" for procedures governing the use of allowances for field testing by an independent testing agency.

1.3 DEFINITIONS

A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.5 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances on a form defined and specified for Change Orders and Contract Modifications.

1.6 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

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, taxes, 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 not to exceed the amounts defined under the General and Supplementary Conditions of the Contract.

D. During Bid, include at the minimum, the contingency allowance noted in this section in the base bid amount.

E. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.8 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
3. Submit substantiation of a change in scope of Work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.

2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Contingency Allowance: Include a contingency allowance of Twenty Thousand Dollars and Zero Cents ($20,000.00) for use according to Architect’s and Owner's written instructions.

END OF SECTION 01 21 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
2. Divisions 2 through 16 Sections for specific requirements and limitations for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions 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. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 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. Substitution Request Form: Use facsimile of form provided in Project Manual.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
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 comparison 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 installations for completed projects with project names and addresses and names and addresses of architects and owners.
h. Material test reports from a 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. If specified product or method of construction cannot be provided within the 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 of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a 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.

1.5 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.

1.6 PROCEDURES

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

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

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: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

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 offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Requested substitution provides sustainable design characteristics that specified product provided.
e. Substitution request is fully documented and properly submitted.
f. Requested substitution will not adversely affect Contractor's construction schedule.
g. Requested substitution has received necessary approvals of authorities having jurisdiction.
h. Requested substitution is compatible with other portions of the Work.
i. Requested substitution has been coordinated with other portions of the Work.
j. Requested substitution provides specified warranty.

k. 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.

PART 3 - EXECUTION (Not Used).

END OF SECTION 01 25 00

012500 - SUBSTITUTION PROCEDURES - REQUEST FORM

ONE SUBSTITUTION PER FORM. FILL IN ALL BLANKS.
PROJECT NO.: _____.
PROJECT TITLE: _____.

We hereby submit for your review the following substitution for the following specified material for the project referenced above.

Section	Page	Specified Material
_____	_____	_____.

Proposed Substitution: _____

_____.

Attach duplicate copies of this form, complete technical data, specifications, colors, laboratory tests and any other information applicable to the proposed substitution, see Section 01600.

Include complete information on changes to Drawings and/or Specifications which the proposed substitution will require for its proper installation.

1. Does the substitution affect dimensions shown or indicated on drawings?

   _____

2. Will the undersigned pay for any changes to the building design, including engineering and detailing costs caused or required by the requested substitution?

   _____

3. What effect does the proposed substitution have on other trades?

   _____

4. What are the differences between the proposed substitution and the item/product/material specified?

   _____

   _____

5. Guarantees/Warranties of the proposed substitution and specified item/product/material are:
   ____Same.
   ____Different (Explain).

   _____
   (Attach copies of Guarantees/Warranties).

6. Will the proposed substitution have any effect on the contract time?

   ____No.
   ____Yes (Explain): _____

7. Will the proposed substitution have any effect on the contract Price?

____No.
____Yes (Explain: _____

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item/product/material.

All requests for substitutions must be submitted through and approved by the General Contractor.

Submitted By:

_____
Signature

_____
Type or Print Name & Title

_____
Company

_____
Address

_____
Date

_____
Phone & Email

General Contractor Approval:

_____
Signature

_____
Type or Print Name & Title

_____
Company

_____
Address

_____
Date

_____
Phone & Email

For Use By Architect/Engineer:

_____ Received to Late to Review.

_____ Not Accepted.

_____ Incomplete Submittal.

_____ Approved, Except as Noted:_____

_____

_____

_____
Signature Plan One/Architects

_____
Date

_____
Signature Consultant

_____
Date

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections include the following:

1. Division 1 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 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 Specifications.

1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request 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 an 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 unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect.

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 taxes, 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 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.
6. Comply with requirements in Division 1 Section "Product Requirements" if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests or contactor’s standard document indicating all required information.

1.5 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the 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 the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material 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 SECTION 01 26 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections include the following:

1. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
2. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules. Create line items specific to each portion of work, coordinate all items with Owner and Architect, include the following:

    a. Application for Payment forms with Continuation Sheets.
    b. Submittals Schedule.
    c. Contractor's Construction Schedule.

2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
3. Sub schedules: Where the Work is separated into phases requiring separately phased payments, provide sub schedules showing values correlated with each phase of payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:

a. Project name and location.
b. Name of Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Submit draft Schedule of Values Pay Application.
3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of the Work.
c. Change Orders (numbers) that affect value.
d. Dollar value.

1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.

7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

9. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use Schedule of Values Pay Application as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Schedule of unit prices.
6. Submittals Schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

11. Initial progress report.
12. Report of preconstruction conference.
13. Initial settlement survey and damage report if required.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used).

PART 3 - EXECUTION (Not Used).

END OF SECTION 01 29 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. Coordination Drawings.
2. Administrative and supervisory personnel.
3. Project meetings.
4. Requests for Interpretation (RFIs).

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

C. Related Sections include the following:

1. Division 1 Section "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
2. Division 1 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request from Contractor seeking interpretation or clarification of the Contract Documents.

1.4 COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
b. Indicate required installation sequences.
c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

2. Sheet Size: At least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Number of Copies: Submit two opaque copies of each submittal. Architect will return one copy.

a. Submit five copies where Coordination Drawings are required for operation and maintenance manuals. Architect will retain two copies; remainder will be returned.

4. Refer to individual Sections for Coordination Drawing requirements for Work in those Sections.

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. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.6 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1. Include special personnel required for coordination of operations with other contractors.

1.7 PROJECT MEETINGS

A. General: Contactor shall schedule and conduct meetings and conferences at Project site, unless otherwise indicated, or as required by owner or architect.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Contactor shall schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing and long-lead items.
d. Designation of key personnel and their duties.
e. Procedures for processing field decisions and Change Orders.
f. Procedures for RFIs.
g. Procedures for testing and inspecting.
h. Procedures for processing Applications for Payment.
i. Distribution of the Contract Documents.

j. Submittal procedures.
k. Preparation of Record Documents.
l. Use of the premises and existing building.
m. Work restrictions.
n. Owner's occupancy requirements.
o. Responsibility for temporary facilities and controls.
p. Construction waste management.
q. Parking availability.
r. Office, work, and storage areas.
s. Equipment deliveries and priorities.
t. First aid.
u. Security.
v. Progress cleaning.
w. Working hours.

3. Minutes: Record and distribute meeting minutes.

C. Preinstallation Conferences: Contractor shall conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. The Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Possible conflicts.
i. Compatibility problems.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's written recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities and controls.
q. Space and access limitations.
r. Regulations of authorities having jurisdiction.
s. Testing and inspecting requirements.
t. Installation procedures.
u. Coordination with other work.
v. Required performance results.
w. Protection of adjacent work.
x. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at monthly intervals or as required by owner or architect. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Status of submittals.
        4) Deliveries.
        5) Off-site fabrication.
        6) Access.
        7) Site utilization.
        8) Temporary facilities and controls.
        9) Work hours.
        10) Hazards and risks.
        11) Progress cleaning.
        12) Quality and work standards.
        13) Status of correction of deficient items.
        14) Field observations.
        15) RFIs.
        16) Status of proposal requests.
        17) Pending changes.
        18) Status of Change Orders.
        19) Pending claims and disputes.
        20) Documentation of information for payment requests.

3. Minutes: Record the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

1.8 REQUESTS FOR INTERPRETATION (RFIs)

A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:

1. Project name.
2. Date.
3. Name of Contractor.
4. Name of Architect.
5. RFI number, numbered sequentially.
6. Specification Section number and title and related paragraphs, as appropriate.
7. Drawing number and detail references, as appropriate.
8. Field dimensions and conditions, as appropriate.
9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
10. Contractor's signature.
11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.

a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.

C. Hard-Copy RFIs: On Contractors generated form acceptable to the Architect.

1. Identify each page of attachments with the RFI number and sequential page number.

D. Software-Generated RFIs: Software-generated form with substantially the same content as indicated above.

1. Attachments shall be electronic files in Adobe Acrobat PDF format.

E. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.

1. The following RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.

c. Requests for coordination information already indicated in the Contract Documents.
d. Requests for adjustments in the Contract Time or the Contract Sum.
e. Requests for interpretation of Architect's actions on submittals.
f. Incomplete RFIs or RFIs with numerous errors.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 1 Section "Contract Modification Procedures."

a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 7 days of receipt of the RFI response.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

G. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used).

PART 3 - EXECUTION (Not Used).

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Daily construction reports.
4. Material location reports.
5. Field condition reports.
6. Special reports.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for submitting the Schedule of Values.
2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
3. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
4. Division 1 Section "Photographic Documentation" for submitting construction photographs.
5. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.

1. Float time belongs to Owner.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

F. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

G. Major Area: A story of construction, a separate building, or a similar significant construction element.

H. Milestone: A key or critical point in time for reference or measurement.

I. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

J. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 SUBMITTALS

A. Qualification Data: For scheduling consultant.

B. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

C. Preliminary Construction Schedule: Submit two opaque copies.

1. Approval of cost-loaded preliminary construction schedule will not constitute approval of Schedule of Values for cost-loaded activities.

D. Contractor's Construction Schedule: Submit two opaque copies of initial schedule, large enough to show entire schedule for entire construction period.

E. Daily Construction Reports: Submit two copies at monthly intervals.

F. Material Location Reports: Submit two copies at monthly intervals.

G. Field Condition Reports: Submit two copies at time of discovery of differing conditions.

H. Special Reports: Submit two copies at time of unusual event.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Use of premises restrictions.

2. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

    a. Subcontract awards.
    b. Submittals.
    c. Purchases.
    d. Fabrication.
    e. Sample testing.
    f. Deliveries.
    g. Installation.
    h. Tests and inspections.
    i. Adjusting.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

2.2 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 30 days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the preliminary network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

    a. Preparation and processing of submittals.
    b. Mobilization and demobilization.
    c. Purchase of materials.
    d. Delivery.
    e. Fabrication.
    f. Utility interruptions.
    g. Installation.
    h. Work by Owner that may affect or be affected by Contractor's activities.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

    a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

D. Initial Issue of Schedule: Prepare initial network diagram from a list of straight "early start-total float" sort. Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Principal events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the Schedule of Values).

E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

F. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.

1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.

2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.

    a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.

2.4 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Substantial Completions authorized.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site.

C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.5 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.

B. Related Requirements:

1. Section 01 33 00 "Submittal Procedures" for submitting photographic documentation.
2. Section 01 77 00 "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.

1.3 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph or video recording. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files within three days of taking photographs.

1. Digital Camera: Minimum sensor resolution of 8 megapixels.
2. Identification: Provide the following information with each image description in file metadata tag:

a. Name of Project.
b. Name and contact information for photographer.
c. Date photograph was taken.
d. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.

1.4 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1. Date and Time: Include date and time in file name for each image.
2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect.

C. Preconstruction Photographs: Before commencement of excavation and commencement of demolition, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.

D. Periodic Construction Photographs: Take photographs weekly, with timing each month adjusted to coincide with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

E. Final Completion Construction Photographs: Take color photographs after date of Substantial Completion for submission as project record documents. Architect will inform photographer of desired vantage points.

F. Additional Photographs: Architect may request photographs in addition to periodic photographs specified.

END OF SECTION 01 32 33

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
3. Division 1 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's Construction Schedule and the Submittals Schedule.
4. Division 1 Section "Closeout Procedures" for submitting warranties.
5. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
6. Division 1 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
7. Divisions 2 through 33 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect's responsive action.

B. Informational Submittals: Written information that does not require Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

1) Interior colors (all color submittals to be received at one time before any selections are made).
2) Exterior colors (all color submittals to be received at one time before any selections are made).
3) Doors and door hardware (both submittals to be received before review will begin).
4) Other related submittals as determined by the Architect.

C. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation" for list of submittals and time requirements for scheduled performance of related construction activities.

D. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. 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.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow 15 days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.

E. Submittals Procedure Timeline: The Contactor shall submit all submittals requiring material and/or color selection to the architect in a timely manner.

1. Initial Submittals shall be submitted within 45 days of the Notice to Proceed or in a timely manner which does not cause delays in the project schedule.
2. All samples for color selections shall be submitted to Architect ASAP and in a timely manner which does not cause delays to the project schedule. No individual color selections will be made.
3. Work delayed due to the untimely submission by the Contractor of items requiring review and/or selection will not be an acceptable cause for an extension in contact time.

F. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

a. Project name.
b. Date.
c. Name and address of Architect.

d. Name and address of Contractor.
e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Submittal number or other unique identifier, including revision identifier.

1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 06100.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 06100.01.A).

i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Location(s) where product is to be installed, as appropriate.
l. Other necessary identification.

G. Deviations: Highlight or otherwise specifically identify deviations from the Contract Documents on submittals.

H. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
2. Additional copies submitted for maintenance manuals will be marked with action taken and will be returned.

I. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review, received from sources other than Contractor.

1. Transmittal Form: Provide locations on form for the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Names of subcontractor, manufacturer, and supplier.
f. Category and type of submittal.
g. Submittal purpose and description.
h. Specification Section number and title.
i. Drawing number and detail references, as appropriate.
j. Transmittal number, numbered consecutively.
k. Submittal and transmittal distribution record.
l. Remarks.
m. Signature of transmitter.

2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.

J. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.

K. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

L. Use for Construction: Use only final submittals with mark indicating "approved, approved as noted or approved as corrected" taken by Architect.

M. State Fire Marshall Submittals: Contractor is to review shop drawings from distributors and submit these shop drawings and product data directly to the State Fire Marshall's Office for approval (after review and approval by Project Engineer) for the following items:

1. Fire Alarm System
2. Fire Sprinkler System
3. Kitchen Hood

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Standard color charts.
    e. Manufacturer's catalog cuts.
    f. Wiring diagrams showing factory-installed wiring.
    g. Printed performance curves.
    h. Operational range diagrams.
    i. Mill reports.
    j. Standard product operation and maintenance manuals.
    k. Compliance with specified referenced standards.
    l. Testing by recognized testing agency.
    m. Application of testing agency labels and seals.
    n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit three copies of Product Data, unless otherwise indicated. Architect will return two copies. Mark up and retain one returned copy as a Project Record Document.

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.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Dimensions.
    b. Identification of products.
    c. Fabrication and installation drawings.
    d. Roughing-in and setting diagrams.
    e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    f. Shopwork manufacturing instructions.
    g. Templates and patterns.
    h. Schedules.
    i. Design calculations.
    j. Compliance with specified standards.
    k. Notation of coordination requirements.
    l. Notation of dimensions established by field measurement.
    m. Relationship to adjoining construction clearly indicated.
    n. Seal and signature of professional engineer if specified.
    o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Number of Copies: Submit two opaque (bond) copies of each submittal. Architect will return one copy.
4. Number of Copies: Submit five opaque copies of each submittal, unless copies are required for operation and maintenance manuals. Submit seven copies where copies are required for operation and maintenance manuals. Architect will retain two copies; remainder will be returned.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

    a. Generic description of Sample.
    b. Product name and name of manufacturer.
    c. Sample source.
    d. Number and title of appropriate Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

    a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
    b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

    a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

    a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample sets; remainder will be returned.

        1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
        2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Number and name of room or space.
3. Location within room or space.
4. Number of Copies: Submit three copies of product schedule or list, unless otherwise indicated. Architect will return two copies.

    a. Mark up and retain one returned copy as a Project Record Document.

F. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation" for Construction Manager's action.

G. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

H. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."

I. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."

J. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.
4. Number of Copies: Submit three copies of subcontractor list, unless otherwise indicated. Architect will return two copies.

    a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit two copies of each submittal, unless otherwise indicated. Architect will not return copies.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements specified in Division 1 Section "Quality Requirements."

B. Coordination Drawings: Comply with requirements specified in Division 1 Section "Project Management and Coordination."

C. Contractor's Construction Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."

D. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

J. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

K. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

L. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

M. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements specified in Division 1 Section "Operation and Maintenance Data."

O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.

7. Other required items indicated in individual Specification Sections.

R. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

S. Material Safety Data Sheets (SDSs): Submit information directly to Owner; do not submit to Architect.

1. Architect will not review submittals that include MSDSs and will return the entire submittal for resubmittal.

2.3 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S 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. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S / ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows:

1. Final Unrestricted Release: When the Architect marks a submittal “Approved,” the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final payment depends on that compliance.
2. Final-But-Restricted Release: When the Architect marks a submittal “Approved as Noted,” the Work covered by the submittal may proceed provided that it complies with notations or corrections on the submittal and requirements of the Contract Documents. Final payment depends on that compliance.
3. Returned for Resubmittal: When the Architect marks a submittal “Not Approved, Revise and Resubmit,” do not proceed with Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the notations; resubmit without delay. Repeat if necessary to obtain different action mark.

    a. Don not use, or allow others to use, submittals marked “Not Approved, Revise and Resubmit” at the Project Site or elsewhere where Work is in progress.

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01 33 00

SECTION 01 35 16 - ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes special procedures for alteration work.

1.2 DEFINITIONS

A. Alteration Work: This term includes remodeling, renovation, repair, and maintenance work performed within existing spaces or on existing surfaces as part of the Project.

B. Consolidate: To strengthen loose or deteriorated materials in place.

C. Design Reference Sample: A sample that represents the Architect's prebid selection of work to be matched; it may be existing work or work specially produced for the Project.

D. Dismantle: To remove by disassembling or detaching an 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.

E. Match: To blend with adjacent construction and manifest no apparent difference in material type, species, cut, form, detail, color, grain, texture, or finish; as approved by Architect.

F. Refinish: To remove existing finishes to base material and apply new finish to match original, or as otherwise indicated.

G. Repair: To correct damage and defects, retaining existing materials, features, and finishes. This includes patching, piecing-in, splicing, consolidating, or otherwise reinforcing or upgrading materials.

H. Replace: To remove, duplicate, and reinstall entire item with new material. The original item is the pattern for creating duplicates unless otherwise indicated.

I. Replicate: To reproduce in exact detail, materials, and finish unless otherwise indicated.

J. Reproduce: To fabricate a new item, accurate in detail to the original, and from either the same or a similar material as the original, unless otherwise indicated.

K. Retain: To keep an element or detail secure and intact.

L. Strip: To remove existing finish down to base material unless otherwise indicated.

1.3 COORDINATION

A. Alteration Work Subschedule: A construction schedule coordinating the sequencing and scheduling of alteration work for entire Project, including each activity to be performed, and based on Contractor's Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for alteration work.

1. Schedule construction operations in sequence required to obtain best Work results.
2. Coordinate sequence of alteration work activities to accommodate the following:
   a. Owner's continuing occupancy of portions of existing building.
   b. Other known work in progress.
   c. Tests and inspections.
3. Detail sequence of alteration work, with start and end dates.
4. Utility Services: Indicate how long utility services will be interrupted. Coordinate shutoff, capping, and continuation of utility services.
5. Equipment Data: List gross loaded weight, axle-load distribution, and wheel-base dimension data for mobile and heavy equipment proposed for use in existing structure. Do not use such equipment without certification from Contractor's professional engineer that the structure can support the imposed loadings without damage.

B. Pedestrian and Vehicular Circulation: Coordinate alteration work with circulation patterns within Project building(s) and site. Some work is near circulation patterns and adjacent to restricted area. Circulation patterns cannot be closed off entirely and in places can be only temporarily redirected around small areas of work. Plan and execute the Work accordingly.

1.4 PROJECT MEETINGS FOR ALTERATION WORK

A. Preliminary Conference for Alteration Work: Before starting alteration work, conduct conference at Project site.

1. Attendees: In addition to representatives of Owner, Architect, and Contractor, testing service representative, specialists, and chemical-cleaner manufacturer(s) shall be represented at the meeting.
2. Agenda: Discuss items of significance that could affect progress of alteration work, including review of the following:
   a. Alteration Work Sub schedule: Discuss and finalize; verify availability of materials, specialists' personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Fire-prevention plan.
   c. Governing regulations.
   d. Areas where existing construction is to remain and the required protection.
   e. Hauling routes.
   f. Sequence of alteration work operations.
   g. Storage, protection, and accounting for salvaged and specially fabricated items.
   h. Existing conditions, staging, and structural loading limitations of areas where materials are stored.
   i. Qualifications of personnel assigned to alteration work and assigned duties.
   j. Requirements for extent and quality of work, tolerances, and required clearances.
   k. Embedded work such as flashings and lintels, special details, collection of waste, protection of occupants and the public, and condition of other construction that affects the Work or will affect the work.
3. Reporting: Record conference results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from conference.

B. Coordination Meetings: Conduct coordination meetings specifically for alteration work at BI-monthly intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.

1. Attendees: In addition to representatives of Owner, Architect, and Contractor, each specialist, supplier, installer, and other entity concerned with progress or involved in planning, coordination, or performance of alteration work activities shall be represented at

these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to alteration work.

2. Agenda: Review and correct or approve minutes of previous coordination meeting. Review other items of significance that could affect progress of alteration work. Include topics for discussion as appropriate to status of Project.
   a. Alteration Work Subschedule: Review progress since last coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited with retention of quality; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities are completed within the Contract Time.
   b. Schedule Updating: Revise Contractor's Alteration Work Subschedule after each coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
   c. Review present and future needs of each entity present, including review items listed in the "Preliminary Conference for Alteration Work" Paragraph in this article and the following:
      1) Interface requirements of alteration work with other Project Work.
      2) Status of submittals for alteration work.
      3) Access to alteration work locations.
      4) Effectiveness of fire-prevention plan.
      5) Quality and work standards of alteration work.
      6) Change Orders for alteration work.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.5 MATERIALS OWNERSHIP

A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to Owner that may be encountered or uncovered during the Work, regardless of whether they were previously documented, remain Owner's property.

1. Carefully dismantle and salvage each item or object in a manner to prevent damage and protect it from damage, then promptly deliver it to Owner where directed at Project site.

1.6 INFORMATIONAL SUBMITTALS

A. Alteration Work Subschedule:

1. Submit alteration work subschedule within 30 days of date established for commencement of alteration work.

B. Preconstruction Documentation: Show preexisting conditions of adjoining construction and site improvements that are to remain, including finish surfaces, that might be misconstrued as damage caused by Contractor's alteration work operations.

C. Fire-Prevention Plan: Submit 30 days before work begins.

1.7 QUALITY ASSURANCE

A. Specialist Qualifications: An experienced firm regularly engaged in specialty work similar in nature, materials, design, and extent to alteration work as specified in each Section and that has

completed a minimum of twenty recent projects with a record of successful in-service performance that demonstrates the firm's qualifications to perform this work.

1. Field Supervisor Qualifications: Full-time supervisors experienced in specialty work similar in nature, material, design, and extent to that indicated for this Project. Supervisors shall be on-site when specialty work begins and during its progress. Supervisors shall not be changed during Project except for causes beyond the control of the specialist firm.
   a. Construct new mockups of required work whenever a supervisor is replaced.

B. Fire-Prevention Plan: Prepare a written plan for preventing fires during the Work, including placement of fire extinguishers, fire blankets, rag buckets, and other fire-control devices during each phase or process. Coordinate plan with Owner's fire-protection equipment and requirements. Include fire-watch personnel's training, duties, and authority to enforce fire safety.

1.8 STORAGE AND HANDLING OF SALVAGED MATERIALS

A. Salvaged Materials for Reinstallation:

1. Repair and clean items for reuse as indicated.
2. Pack or crate items after cleaning and repairing; cushion against damage during handling. Label 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 unless otherwise indicated. Provide connections, supports, and miscellaneous materials to make items functional for use indicated.

B. Existing Materials to Remain: Protect construction indicated to remain against damage and soiling from construction work. Where permitted by Architect, items may be dismantled and taken to a suitable, protected storage location during construction work and reinstalled in their original locations after alteration and other construction work in the vicinity is complete.

C. Storage: Catalog and store items within a weathertight enclosure where they are protected from moisture, weather, condensation, and freezing temperatures.

1. Identify each item for reinstallation with a nonpermanent mark to document its original location. Indicate original locations on plans, elevations, sections, or photographs by annotating the identifying marks.
2. Secure stored materials to protect from theft.
3. Control humidity so that it does not exceed 85 percent. Maintain temperatures 5 deg F or more above the dew point.

1.9 FIELD CONDITIONS

A. Survey of Existing Conditions: Record existing conditions that affect the Work by use of measured drawings preconstruction photographs.

1. Comply with requirements specified in Section 013233 "Photographic Documentation."

B. Discrepancies: Notify Architect of discrepancies between existing conditions and Drawings before proceeding with removal and dismantling work.

C. Owner's Removals: Before beginning alteration work, verify in correspondence with Owner that the following items have been removed:

1. Furnishings.

D. Size Limitations in Existing Spaces: Materials, products, and equipment used for performing the Work and for transporting debris, materials, and products shall be of sizes that clear surfaces within existing spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

PART 2 - PRODUCTS - (Not Used).

PART 3 - EXECUTION

3.1 PROTECTION

A. Protect persons, motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm resulting from alteration work.

1. Use only proven protection methods, appropriate to each area and surface being protected.
2. Provide temporary barricades, barriers, and directional signage to exclude the public from areas where alteration work is being performed.
3. Erect temporary barriers to form and maintain fire-egress routes.
4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during alteration work.
5. Contain dust and debris generated by alteration work, and prevent it from reaching the public or adjacent surfaces.
6. Provide shoring, bracing, and supports as necessary. Do not overload structural elements.
7. Protect floors and other surfaces along hauling routes from damage, wear, and staining.
8. Provide supplemental sound-control treatment to isolate demolition work from other areas of the building.

B. Temporary Protection of Materials to Remain:

1. Protect existing materials with temporary protections and construction. Do not remove existing materials unless otherwise indicated.
2. Do not attach temporary protection to existing surfaces except as indicated as part of the alteration work program.

C. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.

D. Utility and Communications Services:

1. Notify Owner, Architect, authorities having jurisdiction, and entities owning or controlling wires, conduits, pipes, and other services affected by alteration work before commencing operations.
2. Disconnect and cap pipes and services as required by authorities having jurisdiction, as required for alteration work.
3. Maintain existing services unless otherwise indicated; keep in service, and protect against damage during operations. Provide temporary services during interruptions to existing utilities.

E. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is functioning properly.

1. Prevent solids such as adhesive or mortar residue or other debris from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from alteration work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

F. Existing Roofing: Prior to the start of work in an area, install roofing protection as required for the extents of work.

3.2 PROTECTION FROM FIRE

A. General: Follow fire-prevention plan and the following:

1. Comply with NFPA 241 requirements unless otherwise indicated.
2. Remove and keep area free of combustibles, including rubbish, paper, waste, and chemicals, unless necessary for the immediate work.
    a. If combustible material cannot be removed, provide fire blankets to cover such materials.

B. Fire-Control Devices: Provide and maintain fire extinguishers, fire blankets, and rag buckets for disposal of rags with combustible liquids. Maintain each as suitable for the type of fire risk in each work area. Ensure that nearby personnel and the fire-watch personnel are trained in fire-extinguisher and blanket use.

C. Sprinklers: Where sprinkler protection exists and is functional, maintain it without interruption while operations are being performed. If operations are performed close to sprinklers, shield them temporarily with guards.

1. Remove temporary guards at the end of work shifts, whenever operations are paused, and when nearby work is complete.

3.3 PROTECTION DURING APPLICATION OF CHEMICALS

A. Protect motor vehicles, surrounding surfaces of building, building site, plants, and surrounding buildings from harm or spillage resulting from applications of chemicals and adhesives.

B. Cover adjacent surfaces with protective materials that are proven to resist chemicals selected for Project unless chemicals being used will not damage adjacent surfaces as indicated in alteration work program. Use covering materials and masking agents that are waterproof and UV resistant and that will not stain or leave residue on surfaces to which they are applied. Apply protective materials according to manufacturer's written instructions. Do not apply liquid masking agents or adhesives to painted or porous surfaces. When no longer needed, promptly remove protective materials.

C. Do not apply chemicals during winds of sufficient force to spread them to unprotected surfaces.

D. Neutralize alkaline and acid wastes and legally dispose of off Owner's property.

E. Collect and dispose of runoff from chemical operations by legal means and in a manner that prevents soil contamination, soil erosion, undermining of paving and foundations, damage to landscaping, or water penetration into building interior.

3.4 GENERAL ALTERATION WORK

A. Have specialty work performed only by qualified specialists.

B. Ensure that supervisory personnel are present when work begins and during its progress.

C. Record existing work before each procedure (preconstruction), and record progress during the work. Use digital preconstruction documentation photographs. Comply with requirements in Section 01 32 33 "Photographic Documentation."

D. Perform surveys of Project site as the Work progresses to detect hazards resulting from alterations.

E. Notify Architect of visible changes in the integrity of material or components whether from environmental causes including biological attack, UV degradation, freezing, or thawing or from structural defects including cracks, movement, or distortion.

1. Do not proceed with the work in question until directed by Architect.

END OF SECTION 01 35 16

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. 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 actions 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.
4. Specific test and inspection requirements are not specified in this Section.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

E. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

F. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

G. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

H. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

I. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 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 the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly 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.

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Qualification Data: For Contractor's quality-control personnel.

C. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect.
2. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan prepared by Architect.

D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.

B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.

1. Project quality-control manager may also serve as Project superintendent.

C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.

D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents.

E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.7 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. 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.

C. 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.

D. 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.

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 installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections 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. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

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 329; 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. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. 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.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

a. Provide test specimens representative of proposed products and construction.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.

f. When testing is complete, remove test specimens, assemblies; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.9 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 reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. 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.
2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.

3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. 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.

F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. 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 inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. 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. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Architect testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified testing agency or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, as indicated in Statement of Special Inspections attached to this Section, and as follows:

B. Special Tests and Inspections: Conducted by a qualified testing agency or special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections and in Statement of Special Inspections attached to this Section, 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. Notifying 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

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 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 the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."

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 SECTION 01 40 00

SECTION 01 40 00.1 – SPECIAL INSPECTIONS

STATEMENT OF SPECIAL INSPECTIONS

1. Special inspections and structural testing shall be provided by an independent agency employed by the Owner for the items identified in this section and in other areas of the approved construction plans and specifications, unless waived by the Building Official (see IBC Chapter 17).

2. The names and credentials of the Special Inspectors to be used shall be submitted to the Building Official for approval.

3. Duties of the Special Inspector:
   a. The Special Inspector shall review all work listed below for conformance with the approved construction plans and specifications and the 2006 IBC.
   b. The Special Inspector shall furnish special inspection reports to the EOR, Contractor, Owner and Building Official on a weekly basis, or more frequently as required by the Building Official. All items not in compliance shall be brought to the immediate attention of the Contractor for correction, and if uncorrected, to the EOR and the Building Official.
   c. Once corrections have been made by the Contractor, the Special Inspector shall submit a final signed report to the Building Official stating that the work requiring special inspection was, to the best of the Special Inspector's knowledge, in conformance with the approved construction plans and specifications as well as the applicable workmanship provisions of the 2006 IBC.

4. Duties and responsibilities of the Contractor:
   a. The Contractor shall submit a written statement of responsibility to the Owner and the Building Official prior to the commencement of work. In accordance with IBC 1704.4, the statement of responsibility shall contain acknowledgement of the special inspection requirements contained within this "Statement of Special Inspections".
   b. The Contractor shall notify the responsible Special Inspector that work is ready for inspection at least one working day (24 hours minimum) before such inspection is required.
   c. All work requiring special inspection shall remain accessible and exposed until it has been observed by the Special Inspector.
   d. Contractor shall coordinate and maintain Wyoming Department of Health Inspection Records on site. Such inspections shall be performed by the Wyoming Department of Health at required intervals/status identified by the department. Such tests may be coordinated with other trades or the Special Inspector as allowed by the department.
   e. Contractor or their subs shall maintain record of the application of High Performance Coatings as outlined in the correlating specification section.

5. Refer to the attached "Special Inspection Schedule" for the types, extents and frequency of specific items requiring special inspections and structural tests as part of this project.

6. Refer to the attached "Wyoming Department of Health Inspection Record" for the types specific items requiring departmental inspection as part of this project.

SPECIAL INSPECTION SCHEDULE			
Areas requiring special inspection:	Frequency		Comments:
	Continuous	Periodic	
FABRICATORS (IBC 1704.2.5)			
	♦		If fabricator is approved, on-site inspection is not required but a certificate of completion must be provided to the B.O. (IBC 1704.2.2)
SOILS (IBC 1704.7)			
Verify adequate materials below footings		♦	Prior to placement of concrete.
Excavation extend to proper depth and materials		♦	Prior to placement of compacted fill or concrete.
Classification and testing of fill materials		♦	Check classification and gradations at each lift, but not less than once for each 10,000ft² of surface area.
Verify proper fill materials, lift thicknesses and in-place densities	♦		
Verify properly prepared site and subgrade		♦	Prior to placement of concrete.
CONCRETE CONSTRUCTION (IBC 1704.4)			
Reinforcing steel placement		♦	Verify size, clearances, splices and proper ties.
Embedded bolts or plates	♦		
Verify required design mix		♦	Verify mix design meets strength and exposure requirements listed on approved plans.
Concrete placement/sampling	♦		Includes sampling for air, slump, strength and temperature techniques
Inspect formwork		♦	Verify shape, location and member dimensions.
OTHER THAN STRUCTURAL STEEL (IBC 1704.3)			
Steel Roof & Floor Deck:			
Material verification of steel deck		♦	Identification markings per applicable ASTM standard
Floor and deck welds		♦	Verify that welds conform to AWS D1.3.
Welding of Reinforcing Steel:			
Verification of weldability *(except A706 bar)*		♦	Verify material is able to conform to AWS D1.4.
STRUCTURAL STEEL CONSTRUCTION (IBC Table 1704.3)			
Verify high-strength bolts, nuts and washers:		♦	
Inspection of Bearing-type connections		♦	
Inspection of Slip Critical Joints	♦	♦	Turn-of-nut method without matchmarking requires continuous inspection.
Material verification of Structural Steel		♦	Identification markings to conform to ASTM standards and certs.
Material Verification of Weld Filler Materies		♦	Identification markings to conform to AWS standards and certs.

Continued on next page…

SPECIAL INSPECTION SCHEDULE *(continued)*			
Areas requiring special inspection:	Frequency		Comments:
	Continuous	Periodic	
STRUCTURAL STEEL CONSTRUCTION *(continued)*			
During Welding			
Complete and partial penetration groove welds	♦		
Multipass fillet welds	♦		
Single-pass fillet welds > 5/16	♦		
Single-pass fillet welds < 5/16		♦	
Other Steel Inspections *(Table N5.7, AISC 360-10; Tables J8-1 and J10-1, AISC 341-10)*			
Structural steel details		♦	All fabricated steel and their connections shall be inspected to verify compliance with the details shown in the approved plans.
Anchor rods/embeds supporting structural steel		♦	Shall be on the premises during the placement of anchor rods/embedments. Verify diameter, grade, type, and length of element and the extent or depth of embedment prior to placement of concrete.
HIGH PERFORMANCE COATINGS Painting Contractor's Association (PDCA) Standard P13 the inspection and acceptance of architectural paints on the interior surfaces of structures when dry film thickness is specified.			
Interior CMU			
Dry Film Thickness as specified (per manufacturer)		♦	One spot measurement shall be made for every 100 square feet of surface area.
Interior Steel			
Dry Film Thickness as specified (per manufacturer)		♦	One spot measurement shall be made for every 100 square feet of surface area.
Interior Gypsum Board			
Dry Film Thickness as specified (per manufacturer)		♦	One spot measurement shall be made for every 100 square feet of surface area.

HLS/Cons-115
January 2022

Wyoming Department of Health
Aging Division - Healthcare Licensing and Surveys
Hathaway Building, 2300 Capitol Avenue, Suite 510, Cheyenne, WY 82002
Fax: (307) 777-7127 Phone: (307) 777-7123
E-mail: plans-ohls@wyo.gov Website: https://health.wyo.gov/aging/hls/healthcare-facility-construction/

Inspection Record

THIS CARD MUST BE ON THE PREMISES UNTIL THE CONSTRUCTION IS COMPLETED.

Project Number:	**20**	**Date of Plan Approval :**	
Facility/Location:			

INSPECTION	DATE	INSPECTOR	COMMENTS
FOOTING			
FOUNDATION			
DO NOT POUR CONCRETE UNTIL THE ABOVE HAS BEEN SIGNED			
CONCRETE SLAB FLOOR			
ELECTRICAL GROUNDWORK			
UNDER SLAB PLUMBING			
DO NOT POUR FLOOR UNTIL ABOVE HAS BEEN SIGNED			
FRAMING			
ROUGH PLUMBING			
ROUGH MECHANICAL			
ROUGH ELECTRICAL			
ROUGH GAS PIPING			
INSULATION			
COVER NO WORK UNTIL THE ABOVE HAS BEEN SIGNED			
DRYWALL			
FINAL PIPING/ GAS PRES TEST			
FINAL ELECTRICAL			
FINAL PLUMBING			
FINAL MECHANICAL			
FINAL BUILDING			

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Thomson Gale's "Encyclopedia of Associations" or in Columbia Books' "National Trade & Professional Associations of the U.S."

PART 2 - PRODUCTS (Not Used).

PART 3 - EXECUTION (Not Used).

END OF SECTION 01 42 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Sections include the following:

1. Division 1 Section "Summary" for limitations on utility interruptions and other work restrictions.
2. Division 1 Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
3. Division 1 Section "Execution Requirements" for progress cleaning requirements.
4. Divisions 2 through 16 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

1.5 SUBMITTALS

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

B. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.

1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.

3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

C. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

1.6 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.

1.7 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Lumber and Plywood: Comply with requirements in Division 6 Section “Miscellaneous Carpentry."

B. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide bases for supporting posts.

C. Fencing Windscreen Privacy Screen: Polyester fabric scrim with grommets for attachment to chain-link fence, sized to height of fence, in color selected by Architect from manufacturer's standard colors.

D. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.

E. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches.

F. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

2.2 TEMPORARY FACILITIES

A. Field Offices:

1. Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner, Architect, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:

1. Furniture required for Project-site documents, including file cabinets, plan tables, plan racks, and bookcases.
2. Conference room of sufficient size to accommodate meetings of 10 individuals. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot-square tack and marker boards.
3. Drinking water and private toilet.
4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
1. Store combustible materials apart from building.

2.3 EQUIPMENT

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

B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 017700 "Closeout Procedures".

PART 3 - EXECUTION

3.1 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.

1. Locate facilities to limit site disturbance as specified in Division 1 Section "Summary."

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.

3.2 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 and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

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.

D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations 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 installations or elements being installed.

E. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations
1. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

F. Telephone Service: Provide mobile telephone service at the project site.

1. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.
3. Provide temporary, directional signs for construction personnel and visitors.

B. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.

C. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Division 1 Section "Summary."

B. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

C. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

D. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.

3.5 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. Maintenance: Maintain facilities in good operating condition until removal.

C. 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.

1. Materials and facilities that constitute temporary facilities are property of Contractor.
2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 1 Section "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 56 39 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

1.2 DEFINITIONS

A. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

B. 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.

1.3 INFORMATIONAL SUBMITTALS

A. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1.4 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Moving or 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.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements:

1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches apart. High-visibility orange color.
   a. Height: 30 inches.
   b.

2. Backfill Soil: Stockpiled soil mixed with planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

   1) Mixture: Well-blended mix of[2 parts stockpiled soil to 1 part planting soil

PART 3 -

PART 4 - EXECUTION

4.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

4.2 PREPARATION

A. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Flag each plant or each tree trunk at 54 inches (1372 mm) above the ground.

4.3 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones in a manner that will prevent people from easily entering protected areas except by entrance gates.

   1. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.

B. Maintain protection-zone fencing in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

4.4 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving" unless otherwise indicated.

B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Do not allow exposed roots to dry out before placing permanent backfill.

4.5 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

C. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with backfill soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

4.6 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect.

1. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
2. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch uniform thickness to remain.

C. Soil Aeration: Where directed by Architect, aerate surface soil compacted during construction. Aerate 10 ft. (3 m) beyond drip line and no closer than 36 inches (900 mm) to tree trunk. Drill 2-inch- (50-mm-) diameter holes a minimum of 12 inches (300 mm) deep at 24 inches (600 mm) o.c. Backfill holes with an equal mix of augered soil and sand.

4.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 01 56 39

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 01 25 00 "Substitution Procedures" for requests for substitutions.
2. Section 01 42 00 "References" for applicable industry standards for products specified.

1.3 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 Product: 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. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. 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.

1.4 ACTION SUBMITTALS

A. Product List: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:

a. Specification Section number and title.
b. Generic name used in the Contract Documents.
c. Proprietary name, model number, and similar designations.
d. Manufacturer's name and address.
e. Supplier's name and address.
f. Installer's name and address.
g. Projected delivery date or time span of delivery period.
h. Identification of items that require early submittal approval for scheduled delivery date.

3. Initial Submittal: Within 30 days after date of commencement of the Work, submit 3 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.

a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.

4. Completed List: Within 60 days after date of commencement of the Work, submit 3 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
5. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.

B. 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. Substitution Request Form: Use form provided at end of Section 012500.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified material or product cannot be provided.
b. Coordination information, including a list of changes or modifications 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 comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.

f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Acceptance: Change Order.
b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 1 Section "Submittal Procedures." Show compliance with requirements.

1.5 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. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT 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 the 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.

1.7 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 the 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 017700 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that 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.
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. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
7. Or Equal: Where products are specified by name and accompanied by the term "or equal" or "or approved equal" or "or approved," comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.
   a. Substitutions may be considered, unless otherwise indicated.
2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
   a. Substitutions may be considered, unless otherwise indicated.
3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
   a. Substitutions may be considered, unless otherwise indicated.

4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
   a. Substitutions may be considered, unless otherwise indicated.
5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled "Available Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
7. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Comply with provisions in "Product Substitutions" Article.
8. Basis-of-Design Products: Where Specification paragraphs or subparagraphs titled "Basis-of-Design Products" are included and also introduce or refer to a list of manufacturers' names, provide either the specified 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 named. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.

a. Substitutions may be considered, unless otherwise indicated.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

B. 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:
1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. 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.

2.3 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. 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 SECTION 01 60 00

01 60 00 - SUBSTITUTION REQUEST FORM

Note: Product substitution requests must be received by the Architect ten (10) calendar days prior to the bid date to be considered. Requests received after this time will not be considered.

ONE SUBSTITUTION PER FORM. FILL IN ALL BLANKS.

PROJECT NO.: _____.

PROJECT TITLE: _____.

We hereby submit for your review the following substitution for the following specified material for the project referenced above.

Section	Page	Specified Material
_____	____	_____.

Proposed Substitution:

_____

_____

Attach duplicate copies of this form, complete technical data, specifications, colors, laboratory tests and any other information applicable to the proposed substitution, see Section 01 60 00 “.

Include complete information on changes to drawings and/or specifications which the proposed substitution will require for its proper installation.

1. Does the substitution affect dimensions shown or indicated on drawings?

   _____

2. Will the undersigned pay for any changes to the building design, including engineering and detailing costs caused or required by the requested substitution?

   _____

3. What effect does the proposed substitution have on other trades?

   _____

4. What are the differences between the proposed substitution and the item/product/material specified?

   _____

5. Guarantees/Warranties of the proposed substitution and specified item/product/material are:
   ____Same.
   ____Different (Explain) : _____

   _____
   (Attach copies of Guarantees/Warranties).

6. Will the proposed substitution have any effect on the contract time?
   ____No.
   ____Yes (Explain) : _____

7. Will the proposed substitution have any effect on the contract price?

____No.
____Yes (Explain): _____

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item/product/material.

All requests for substitutions must be submitted through and approved by the General Contractor.

Submitted By:	General Contractor Approval:
_____	_____
Signature	Signature
_____	_____
Type or Print Name & Title	Type or Print Name & Title
_____	_____
Company	Company
_____	_____
Address	Address
_____	_____
Date	Date
_____	_____
Phone & Email	Phone & Email

For Use By Architect/Engineer:

_____ Received to Late to Review.	_____ Incomplete Submittal.
_____ Not Accepted.	_____ Approved, Except as Noted:_____
	_____
	_____
_____	_____
Signature Plan One/Architects	Signature Consultant
_____	_____
Date	Date

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.

B. Related Requirements:

1. Section 01 10 00 "Summary" for coordination of Owner-furnished products, and limits on use of Project site.
2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 PREINSTALLATION MEETINGS

1. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

B. Layout Conference: Conduct conference at Project site.

1. Prior to establishing layout of new perimeter and structural column grid(s), review building location requirements. Review benchmark, control point, and layout and dimension

requirements. Inform Architect and Owner's Representative of scheduled meeting. Require representatives of each entity directly concerned with Project layout to attend, including the following:

a. Contractor's superintendent.
b. Professional surveyor responsible for performing Project surveying and layout.
c. Professional surveyor responsible for performing site survey serving as basis for Project design.

2. Review meanings and intent of dimensions, notes, terms, graphic symbols, and other layout information indicated on the Drawings.
3. Review requirements for including layouts on Shop Drawings and other submittals.
4. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For third party land surveyor.

B. Certificates: Submit certificate signed by land surveyor, certifying that location and elevation of improvements comply with requirements.

C. Cutting and Patching Plan: Submit plan describing procedures at least 10 days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

D. Landfill Receipts: Submit two copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.6 QUALITY ASSURANCE

A. Professional Engineer Qualifications: Refer to Section 014000 "Quality Requirements."

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

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.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 EXAMINATION

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. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. 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.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect and Owner’s Representative in accordance with requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

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

B. Engage a third-party land surveyor or experienced personnel who displays 10 years’ experience in surveying and staking to lay out the Work, using the following accepted surveying practices:

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect and Owner’s Representative when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Owner's Representative.

3.4 INSTALLATION

A. 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.
4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces, unless otherwise indicated on Drawings.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

D. 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 of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

J. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 01 77 00 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.5 CUTTING AND PATCHING

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of Work to be cut.

D. 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.

E. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."

F. 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 minimize interruption to occupied areas.

G. 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 adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's 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.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

H. 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 practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. 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. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 COORDINATION OF OWNER'S PORTION OF THE WORK

A. Site Access: Provide access to Project site for Owner's construction personnel.

1. Provide temporary facilities required for Owner-furnished, Contractor-installed products.
2. Refer to Section 01 10 00 "Summary" for other requirements for Owner-furnished, Contractor-installed products

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

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.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 50 00 "Temporary Facilities and Controls."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.9 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

D. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 01 73 00

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Warranties.
3. Final cleaning.

B. Related Sections include the following:

1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
3. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
4. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Division 1 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
6. Divisions 2 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.

C. Field Report: For pest control inspection.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.5 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. 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 certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.6 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. 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.

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit two copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

a. Project name.
b. Date.
c. Name of Architect.
d. Name of Contractor.
e. Page number.

1.8 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. 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.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
o. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.

1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.

p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
q. Replace parts subject to unusual operating conditions.
r. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.

a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.

3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

PROJECT CLOSE OUT CHECK LIST
PLAN ONE/ARCHITECTS

Date: _____

This appendix serves as a check list of the items that should be either in the Owners position or functions that should be performed prior to processing the Contractors final payment.

☐ **Warranties:** Documentation that all applicable manufacturer and equipment warranties have been transferred to the owner.

☐ **Manufacturers Operation and Maintenance Manuals:**
Received Date: _____

☐ **Record of Project Quality Control:**
System Startup and Testing Documentation
Received Date: _____

☐ **Training and System Startup:** **Warranty Start Date:**
Training Date (s)

Electrical _____	_____
Mechanical _____	_____
Plumbing _____	_____
Carpet _____	_____
Fire Alarm Systems _____	_____
HVAC _____	_____
PA Systems _____	_____
Other _____	

☐ **State Electrical Inspectors Final Inspection:**
Date: _____

☐ **State or Local Fire Marshals Final Inspection:**
Date: _____

☐ **Specialties Inspections:**
Date: _____

☐ **Substantial Completion:**
Date: _____

☐ **Final Building Inspection:**
Date: _____

☐ **Issuance of Certificate of Occupancy:**
Date: _____

☐ **Sign Off of Final Completion:**
Contractors will certify in writing that he has constructed the facility in accordance to the plans and specifications.
Date: _____

☐ **Release of Claims (Subcontractors& Suppliers):** Verification that all Subcontractors have submitted affidavit verification that no claims are pending.
Date: _____

DRAFT

☐ **Release of Liens from Contractors:**
Date: _____

☐ **Contractor Turns over keys and lock combinations:**
Date: _____

☐ **Contractors Letter of Construction Warranty:**
Start Date: _____
Completion Date: _____

☐ **Warranty Eleven (11) Month Inspection:**
Scheduled date: _____

☐ **Contractors "Request for Retainage Release"**
Date: _____

☐ **Public Advertisement Final Notice of Acceptance:**
Date: _____

☐ **Project Turnover Memorandums:**
Utilities Date: _____
Communications Date: _____
Building Insurance Date: _____
Others Date: _____

☐ **As-Build Drawings:**
Received date: _____

☐ **Request of Final Payment**:
Date: _____

☐ **Consent of Surety:**
Name of Surety:
Address of Surety:
Telephone Number of Surety:
Date: _____

☐ **Project Accounts:**
Release of retainage Account to Contractor
Finalize all billings

☐ **Archive Project Records:**
Scheduled date: _____
__ (Thirty days after last activity)

DRAFT

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Product maintenance manuals.
5. Systems and equipment maintenance manuals.

B. Related Requirements:

1. Division 1 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
2. Divisions 2 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.

C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.

1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

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. Include a section in the directory for each of the following:

1. List of documents.
2. List of systems.
3. List of equipment.
4. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Architect.
7. Cross-reference to related systems in other operation and maintenance manuals.

C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

E. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

   a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
   b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
3. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

   a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
   b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor has delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: 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, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
5. Aligning, adjusting, and checking instructions.

6. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

C. 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.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

D. Manufacturers' 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 not available and where the information is necessary for proper operation and maintenance of equipment or systems.

E. 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. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Division 1 Section "Project Record Documents."

F. Comply with Division 1 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Record Drawings.
2. Record Specifications.
3. Record Product Data.

B. Related Requirements:

1. Division 1 Section "Closeout Procedures" for general closeout procedures.
2. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
3. Divisions 2 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit one set of marked-up record prints.

B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.

C. Record Product Data: Submit one copy of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

1.4 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Dimensional changes to Drawings.
b. Revisions to details shown on Drawings.
c. Depths of foundations below first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directive.
k. Changes made following Architect's written orders.
l. Details not on the original Contract Drawings.
m. Field records for variable and concealed conditions.
n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:

a. Project name.
b. Date.
c. Designation "PROJECT RECORD DRAWINGS."
d. Name of Architect.
e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders, record Product Data, and record Drawings where applicable.

1.6 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

PART 2 - EXECUTION

2.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Qualification Data: For instructor.

C. Attendance Record: For each training module, submit list of participants and length of instruction time.

D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of videographer.
c. Name of Architect.
d. Name of Construction Manager.
e. Name of Contractor.

f. Date of video recording.

2. Transcript: Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
3. Transcript: Prepared in PDF electronic format. Include a cover sheet with same label information as the corresponding video recording and a table of contents with links to corresponding training components. Include name of Project and date of video recording on each page.
4. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

D. Preconstruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

   a. System, subsystem, and equipment descriptions.
   b. Performance and design criteria if Contractor is delegated design responsibility.
   c. Operating standards.
   d. Regulatory requirements.
   e. Equipment function.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.

2. Documentation: Review the following items in detail:

   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project record documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.

j. Operating procedures for system, subsystem, or equipment failure.
k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner with at least seven days' advance notice.

D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

E. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 01 79 00

SECTION 02 41 00 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Selective demolition of built site elements.

B. Selective demolition of building elements for alteration purposes.

C. Salvage of existing items to be reused or recycled.

1.2 RELATED REQUIREMENTS

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

B. Section 01 10 00 “Summary”: Limitations on Contractor's use of site and premises.

C. Section 01 56 39 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.

D. Section 01 50 00 "Temporary Facilities and Controls": Site fences, security, protective barriers, and waste removal.

E. Section 01 56 39 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.

F. Section 01 70 00 "Execution and Closeout Requirements": Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

G. Section 31 10 00 "Site Clearing": Vegetation and existing debris removal; earth stripping and stockpiling.

1.3 DEFINITIONS

A. Demolish: Dismantle, raze, destroy, or wreck any building or structure or any part thereof.

B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.

C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.

D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.4 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.5 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.6 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at [Project site] <Insert location>.

1. Retain subparagraphs below if additional requirements are necessary; revise as required.

2. Inspect and discuss condition of construction to be selectively demolished.

3. Review structural load limitations of existing structure.

4. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

5. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

6. Review areas where existing construction is to remain and requires protection.

1.7 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Site Plan: Indicate:

1. Areas for temporary construction and field offices.

C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

D. INFORMATIONAL SUBMITTALS

1. Qualification Data: For refrigerant recovery technician.

2. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property for environmental protection, dust control and noise control. Indicate proposed locations and construction of barriers.

3. Schedule of Selective Demolition Activities: Indicate the following:

a. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owners on-site operations are uninterrupted.

b. Interruption of utility services. Indicate how long utility services will be interrupted.

c. Coordination for shutoff, capping and continuation of utility services.

d. Coordination of Owners continuing occupancy of portions of existing building and of Owners partial occupancy of completed work.

4. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces that might be misconstrued as damage caused by demolition operations. Comply with Section 01 32 33 "Photographic Documentation." Submit before work begins.

5. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

E. CLOSEOUT SUBMITTALS

1. Inventory: Submit a list of items that have been removed and salvaged.

1.8 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

2.2 FIELD CONDITIONS

A. Retain, revise, or delete this article to suit Project. Insert other limitations if necessary, such as when adjacent floors will be occupied.

B. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

E. 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 and Owner. Hazardous materials will be removed by Owner under a separate contract.

F. Storage or sale of removed items or materials on-site is not permitted.

G. 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.

PART 3 - EXECUTION

3.1 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.

2. Comply with applicable requirements of NFPA 241.

3. Use of explosives is not permitted.

4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.

5. Provide, erect, and maintain temporary barriers and security devices.

6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.

7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

8. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.

B. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.

C. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

1. Do not begin removal until receipt of notification to proceed from Owner.

2. Do not begin removal until built elements to be salvaged or relocated have been removed.

D. Protect existing structures and other elements to remain in place and not removed.

1. Provide bracing and shoring.

2. Prevent movement or settlement of adjacent structures.

3. Stop work immediately if adjacent structures appear to be in danger.

4. Minimize production of dust due to demolition operations. Do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

E. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Dismantle existing construction and separate materials.

2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

F. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.2 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

3.3 WARRANTY

A. Existing Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following: Single Ply Membrane Roofing. See section 07 01 50.19 “Preparation for Re-roofing”.

B. Notify warrantor on completion of selective demolition and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

3.4 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owners operations.

3.5 INFECTION CONTROL MEASURES

A. The following procedures are to be followed during selective demolition activities:

1. Painting and sanding.

2. Wall coverings, electrical trim work, major plumbing.

3. Other activities that generate dust, debris and as outlined in the Drawings.

B. Infection Control Measures.

1. Dust barrier and tacky walk-off mats will be installed as shown on the demolition drawings.

2. Duct work for HVAC will be removed and capped. This will prevent air from returning dust particles back through the unit.

3. Workers will use exhaust fans to alleviate as mush dust as possible.

4. Immediately replace ceiling tiles upon completion of area.

5. Wet wipe and vacuum the area and disinfect surfaces. Clean work zones and surrounding area daily.

6. Make sure every construction worker understands the absolute requirement and necessity of infection control measures.

7. Other infection control practices will be implemented as problems arise.

8. Additional measures to be followed are identified in the ICRA attached to the end of this section.

3.6 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.

1. Verify construction and utility arrangements are as indicated.

2. Report discrepancies to Architect before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from areas that remain occupied.

1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure, except for interruptions required for replacement or modifications; prevent water and humidity damage.

D. Remove existing work as indicated and required to accomplish new work.

1. Remove items indicated on drawings.

E. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.

1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.

2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

3. See Section 011000 - Summary for limitations on outages and required notifications.

4. Verify that abandoned services serve only abandoned facilities before removal.

F. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

G. Protect existing work to remain.

H. Prevent movement of structure. Provide shoring and bracing as required.

I. Perform cutting to accomplish removal work neatly and as specified for cutting new work.

J. Repair adjacent construction and finishes damaged during removal work.

K. Patch to match new work.

3.7 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. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

D. 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. See Section 07 31 13 Asphalt Shingles for new roofing requirements.

1. Remove existing roof flashings and roof accessories.
2. Remove existing roofing system down to substrate.

3.8 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

1. 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 SECTION 02 41 00 SELECTIVE DEMOLITION

Mark Gordon, Governor

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Todd Parfitt, Director

April 10, 2025

Pat Davis, Chief of Life Safety & Construction Branch
Department of Health, Aging Division
Healthcare, Licensing and Surveys
Hathaway Bldg.
2300 Capitol Ave., Ste 510
Cheyenne, WY 82002

RE: WLRC - Reconstruction Aquatic Center OHLS#2025-025
Lander, Wyoming

Mr. Davis,

This letter is being written to explain information provided to the Wyoming Asbestos Program by Mr. Nate Miller of Wyoming Department of Health and your office for this project.

The Wyoming Asbestos Program received an email from Mr. Miller on April 09, 2025, with drawings, scope of work and a current asbestos inspection. An email was received from your office on April 9th, 2025, to provide the Department of Health information for this project. No asbestos-containing material was found in the building materials that were sampled as part of this project.

Based on the information provided, it appears that a thorough asbestos inspection has been performed for the work. If additional suspect material is identified or uncovered during the project, the work must stop until that material has been examined by a trained Building Inspector to determine if it is suspect.

I am writing this letter to indicate that I have received information on this project from Mr. Miller and to state that it appears our requirements have been met for the Reconstruction Aquatic Center project.

Sincerely,

Teresa Minnich-Young

Teresa Minnich-Young
Asbestos Coordinator

RE: Mr. Miller with Wyoming Department of Health (nate.miller@wyo.gov)

SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT

WYOMING LIFE RESOURCE CENTER

LANDER, WYOMING

Prepared for:

State of Wyoming – State Construction Department
700 West 21st Street
Cheyenne, Wyoming 82002

Inberg-Miller Engineers
124 East Main Street • Riverton, Wyoming 82501

January 17, 2017 18839-GX

PDF REPORT EMAILED: BILLY.HOLMES@WYO.GOV
THIS CONSTITUTES THE ORIGINAL

Mr. Billy Holmes
State of Wyoming – State Construction Department
700 West 21st Street
Cheyenne, WY 82002

RE: SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT
WYOMING LIFE RESOURCE CENTER
LANDER, WYOMING

Dear Mr. Holmes:

This letter transmits our Subsurface Exploration and Geotechnical Engineering report for the above-referenced project. The work described in this report has been completed in accordance with our Contract for Professional Geotechnical Services and November 30, 2016 Revised Proposal.

It has been a pleasure participating in this project. Additional services we could provide include:

- environmental assessment
- civil engineering
- plan and specification review
- surveying
- construction materials testing
- observation of excavations and earthwork

If you have any questions or comments, please contact us at 307-875-4394.

Sincerely,

INBERG-MILLER ENGINEERS



Glen M. Bobnick, P.E.
Senior Geotechnical Engineer
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REVIEWED BY:

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Enclosures as stated
c: Mr. Paul Ernst, MOCA

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1.0 INTRODUCTION

1.1 EXECUTIVE SUMMARY

Based on information obtained from our subsurface exploration and laboratory testing of recovered samples, it is our opinion that the site is suitable for construction of the proposed Wyoming Life Resource Center Expansion project. In general, our subsurface exploration encountered the following strata and conditions:

Overburden – The site is covered with a mixture of clay, silt, sand and gravel extending from ground surface to a depth of between 5.0 and 15.0 feet. This overburden is substantially alluvium, although it likely includes some re-worked native soils as fill or backfill for the existing site improvements. This stratum generally has moderate strength and compressibility. Petroleum odor was observed at test boring B5, and may indicate contaminated soil at that location.

Sedimentary Bedrock – All test borings that explored subsurface conditions for the buildings (25-foot nominal depth) were terminated within sedimentary bedrock. Sedimentary bedrock is claystone, and is mapped geologically as Cody Shale. Cody Shale has moderate to high strength and low to moderate compressibility depending on weathering. This stratum is typically highly weathered at its upper surface, and the amount of weathering diminishes with depth, in this case it is not considered unweathered within the range of subsurface exploration, although it is suitable as a bearing stratum for deep foundations. The test borings indicate that the claystone surface tends to dip to the northwest across the project area, with surface depths less than 10 feet below existing grade along the east side of the project.

Groundwater – Groundwater was sporadically encountered among the test borings, and is present within overburden above the sedimentary bedrock. A total of 4 of 26 deep test borings encountered groundwater, which occurred at depths of between 5.0 and 15.0 feet.

Specific geotechnical issues that were identified during the course of our subsurface exploration included the following:

1. Expansive claystone bedrock is present at elevations that may coincide with basement footing bearing elevation, or there is insufficient separation from foundations, such that risk of heave is moderate to high in certain project areas. The potential for swell and building heave is high where the bedrock is relatively hard and dry, and there is less than 5 feet of separation between footings and claystone. Such conditions appear likely even for footings bearing at minimum frost protection depths along the east side of the project, and particularly near the location of test borings B4, B6, B7 and B19 to B21.

2. Groundwater is variably present but mostly below depths where it could impact buildings. Because groundwater levels could rise and because potentially expansive soils are present, proper design should include a system of building perimeter drains.

In summary, key geotechnical recommendations that apply to this project include:

1. Where there is at least 5 feet of separation between footings and claystone, there is relatively low risk of vertical movement due to swelling soil, and buildings may utilize shallow spread footings. Recommendation of shallow foundations is predicated upon the satisfactory performance of existing building foundations bearing at the same depth at the same location, otherwise historical problems may preclude shallow foundations. Further, the overburden includes weak and compressible soil in places, and therefore bearing pressure will be limited unless the foundation subgrade is improved by overexcavation and replacement with compacted structural fill. Where risk of vertical movement due to heave is not tolerable, buildings should be founded on a system of drilled piers to avoid circumstances where sedimentary bedrock is relatively shallow, dry and prone to swell if moisture increases for any reason.

2. Helical piers are a potential alternative deep foundation system to mitigate potential heave due to swelling soil. Helical piers that are relatively robust in design and construction, and can be reliably embedded in the sedimentary bedrock should perform satisfactorily. Because helical piers are a proprietary product and subject to manufacturer quality as well as application design and installation quality, they are addressed only in summary.

3. A subsurface drainage system for any structures that have below-grade spaces, crawl spaces, buried utility vaults or tunnels is recommended. The drainage system should preferably gravity drain to a collection point or where water can reliably discharge to a maintained ditch or other drainage system. Dewatering during construction may be required near test boring B19 where groundwater was encountered at a depth of 5 feet.

1.2 PURPOSE AND SCOPE OF SERVICE

Inberg-Miller Engineers was requested by the Wyoming Department of Health to perform a subsurface exploration and prepare this geotechnical engineering report for the purpose of providing recommendations for the design of various components of the expansion project. Our specific scope of service is described by our November 30, 2016 Revised Proposal and subsequent Amendments, as applicable.

2.0 CONDITIONS

2.1 PROJECT CONDITIONS

Project conditions were either described by Martin-Martin Wyoming, or were assumed based on our experience with similar types of construction. These conditions are tabulated below, and form the basis for recommendations provided within this report. Please contact Inberg-Miller Engineers if conditions differ from those stated.

Column Load Range (kips)	30 to 60
Wall Load Range (kips per foot)	2.0 to 4.0
Floor Loads (psf)	0 to 100
Other Loads:	None known
Maximum Cut (feet)	3
Maximum Fill (feet)	3
Pavement Loading (ESAL)	Up to 365,000 for 20 years
Total Settlement Tolerance (inches)	1.0
Differential Settlement Tolerance (inches per 50 feet)	0.5
Foundations and subsurface building spaces may be present. No known building heave or settlement problems per owner.	

2.2 SOIL/ROCK CONDITIONS

A summary of soil or rock conditions that were encountered and recorded on the logs is provided below. For a more detailed description of conditions refer to the test boring logs presented in Appendix A. The approximate surface contour of the sedimentary bedrock stratum is illustrated on the bedrock topographic map also in Appendix A.

	Overburden	Sedimentary Bedrock
USCS Classification	CL, SC, SM, SM	CH
Density/Consistency	Medium dense to dense, or stiff to hard	Stiff to hard
Boring Occurrence	all	All except 5' pavement borings
Vertical Limits	0 to 15 ft	Below 7.5 to 15'
Strength	Moderate	Moderate to High
Compressibility	Moderate	Moderate to Low
Permeability	Moderate	Low
Moisture Sensitivity	Moderate	High
Frost Susceptibility	Moderate to High	High
Shrink-Swell Potential	Moderate	High
Collapse Potential	Low	Low

2.3 GROUNDWATER CONDITIONS

A summary of groundwater observations and measurements that were made during the subsurface exploration are provided below. Additional details are documented on the test boring logs presented in Appendix A.

Boring No.	Observed Groundwater Depth (feet)	Date
B1	15.0	12-20-16
B9	7.5	12-21-16
B19	5.0	12-19-16
B29	11.0	12-22-16

A "French drain" is evidently located near test boring B9, however details of its construction or purpose are not known.

Groundwater conditions could change with seasonal or long-term changes in climatic conditions and post-construction changes in irrigation and surface water runoff. Generally, developed sites have a significantly greater volume of water available to percolate into the ground due to irrigation and storm water runoff from hard surfaces. Localized, perched groundwater tables may develop above clay layers or bedrock, or within the foundation backfill zone. Our experience observing construction of deep foundation systems within the Cody Shale bedrock indicates that groundwater flow can be highly localized to occur within bedrock fractures. Although not observed in all our test borings, it is possible for groundwater to be encountered during foundation installation, and should be anticipated.

3.0 RECOMMENDATIONS

3.1 SITE PREPARATION AND EARTHWORK

Site Preparation

Stripping Depth (inches)	0 to 6
Proof-Rolling	Pavement and slab subgrade, fill base

1. Proof-rolling should be performed with a wheeled vehicle exerting relatively high soil-contact pressure for the subject area, considering space constraints and access. Examples of suitable equipment include loaded dump trucks or end-loaders carrying a full bucket of soil.

2. Subgrades to receive structures, pavement or fill material should respond uniformly to loading, and be free of organic materials, protruding rocks, debris, old fill, buried structures, or otherwise soft and compressible soil or material.

3. Weak or yielding subgrades should be repaired as recommended by the geotechnical engineer. Repairs may include soil excavation and replacement, possibly including proper geotextile fabric, depending on circumstances.

Fill and Backfill Materials

Classification	Suitable Materials	Source
Structural Fill	WYDOT Grading W, Envelope A	Imported
Slab Fill	Envelope A	Imported
Slab Subbase	WYDOT Grading W	Imported
Pavement Base	WYDOT Grading W	Imported
Pavement Subbase	USCS-SW, SP, GW, GP, SC, GC	On-site
Site Fill	Native Site Soil	On-site

1. Specification for recommended graded materials are as follows:

Structural Fill Envelope A			WYDOT Grading W Crushed Aggregate Base	
Sieve	**Percent Finer**		**Sieve**	**Percent Finer**
1½"	100		1½"	100
#4	50-100		1"	90-100
#8	30-90		½"	60-85
#30	15-75		#4	45-65
#50	10-60		#8	33-53
#200	0-20		#200	3-12
Liquid Limit < 40, PI < 15			**Liquid Limit < 25, PI < 3**	

Compaction

Below Foundations	6 inch layers, 95% ASTM D698
Below Pavements and Slabs	8 inch layers, 95% ASTM D698
Trenches	8 inch layers, 95% ASTM D698
Site Fill/landscaped Areas	12 inch layers, 95% ASTM D698

1. Engineered fill should be moisture-conditioned before placement and compaction, with preferred moisture contents ranging from 4 percent below to 2 percent above the optimum moisture content. The contractor's equipment and procedures should produce a horizontal, uniformly mixed and compacted lift. In-place density and water content of each lift of fill materials should be tested and approved, or as otherwise recommended by the geotechnical engineer.

2. If construction takes place during cold weather, care should be taken to prevent construction on frozen soils. In addition, fill materials should not contain snow and/or ice and should not be placed in a frozen condition.

Temporary and Permanent Slopes

Temporary Fill Slope	2.5 H: 1 V
Temporary Cut Slope	2.0 H: 1 V
Permanent Fill Slope	3.0 H: 1 V
Permanent Cut Slope	4.0 H: 1 V

1. Slopes, whether temporary or permanent, will require careful management of surface water through design and maintenance to protect slopes from saturation.

2. Slopes should be protected from erosion with vegetation, matting or other measures.

3.2 GROUND IMPROVEMENTS

Foundations

Location	**Below shallow spread foundations (as applicable for increased bearing pressure)**
Overexcavation Depth and Width	24 inches below bearing elevation, 24 inches outside footing perimeter
Backfill	Structural fill
Compaction	6 inch layers, 95% ASTM D 698
Geosynthetic Reinforcement	TenCate RS 380i at locations recommended by the geotechnical engineer of record, or where needed to properly compact structural fill

Pavement

Location	**Below flexible pavement (where needed to stabilize yielding areas identified by proofrolling)**
Overexcavation Depth and Width	12 inches below pavement base, 12 inches outside pavement edge
Backfill	Structural fill
Compaction	6 inch layers, 95% ASTM D 698
Geosynthetic Reinforcement	TenCate RS 280i at locations recommended by the geotechnical engineer of record, or where needed to properly compact structural fill

1. Geosynthetic should be placed completely across the exposed excavation bottom and sides (if applicable), with sufficient overlap to allow for settlement and stretching. However, fabric should be placed in tension with as few wrinkles and folds as practical. We recommend a minimum of 2 feet overlap, or as recommended by the manufacturer.

2. Geosynthetic seams should be placed transverse to the trench or traffic direction as applicable.

3. Geosynthetic should extend up the sides of the trench and a minimum of 12 inches above the foundation bearing elevation where used below footings. Fabric edges should lap over the top of structural fill where used below footings.

3.3 SHALLOW FOUNDATIONS

Suitable Bearing Strata	**24" Compacted Structural Fill or undisturbed native non-expansive granular soil**
Bearing Pressure	2,500 psf (24" structural fill) 1,500 psf (compacted native soil)
Pressure Increase for transient loading	33 percent
Minimum Footing Width	
Continuous	18"
Isolated Pad	36"
Maximum Footing Width	
Continuous	Not applicable
Isolated Pad	
Total Settlement	1.0"
Differential Settlement (inches/feet horizontal distance)	0.5"/50 feet
Potential Heave Conditions	Low to moderate depending on claystone depth, density and moisture content
Potential Collapse Conditions	Low
Embedment	
Exterior Footings	48"
Interior Footings	12"

1. As applicable, excavation to the footing subgrade in bedrock should be performed carefully to avoid excavation beneath the proposed foundation elevation. All loose soil and rock fragments should be removed from the foundation subgrade, which may require some hand work. If the footing subgrades require leveling (less than 6-inches), portland cement concrete should be used as the leveling course. Deeper fills beneath the foundations can be completed using structural fill or lean concrete as defined in the Earthwork section above, or footings can be extended to the excavation depth and be placed on well-prepared bedrock.

2. Foundations supported on new fills greater than about 3 feet may experience additional settlement due to settlement of the new fill and the weight of the fill on the subgrade soils.

3. Footing subgrades should be observed by the Geotechnical Engineer prior to concrete placement, to identify suitable bearing materials, and to observe whether the foundation soils have been properly prepared prior to foundation construction. All loose or soft soils in the footing excavation should be removed from the foundation excavation prior to concrete placement. Footings should not be placed on either uncompacted native soil or uncompacted fill.

3.4 SLABS-ON-GRADE

Suitable subgrade strata	Compacted native site soils below recommended base and subbase
Base	6" WYDOT Grading W
Subbase	12" Slab Fill (Envelope A)
Maximum Allowable Bearing Pressure (psf)	100
Subgrade Modulus (pci)	100
Moisture Vapor Control	Synthetic membrane per item 4 below
Potential Heave Conditions	Low to moderate
Potential Collapse Conditions	Low

1. The aggregate base course will not provide an effective capillary break for moisture rise to the slab. Soil beneath the aggregate base can be properly prepared native soil or structural fill prepared as described in the Site Preparation and Fill Section above.

2. The floor slabs should have an adequate number of joints to reduce cracking resulting from differential movement, shrinkage, and curing stresses. The floor slab should be considered "floating" and may move differentially with respect to the building and foundation supported equipment. Consequently, isolation joints should be placed between the floor, building walls, and foundation supported equipment.

3. If potential heave or collapse conditions have been identified, the floor slab should be supported independently from the foundation system. The slab should be isolated from perimeter walls and allowed to move vertically and separately from the building frame. Partitions and interior walls should be constructed to allow vertical movement of the floor where expansive soil is within 5-feet below the floor.

4. If moisture vapor control is recommended, synthetic vapor barriers should comply with ASTM E1745, Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs, and have a performance characteristic of 0.006 Water Vapor Transmission Rate (WVTR) or lower as tested by ASTM E96. Vapor barriers should be installed per the manufacturer's recommendations.

5. If concrete is placed directly on a vapor barrier, special care is required in concrete mix design for shrink resistance as well as in placement practices to avoid the effects of differential drying caused by the barrier and environmental conditions. If granular soil is placed between the concrete and vapor barrier, care is required to prevent water from entering the soil and becoming trapped prior to concrete placement.

3.5 PAVEMENT

Pavement Type	Truck and Drive Areas	Passenger Car Parking
ESAL per Day	50	15
Asphalt Pavement		
Plant Mix Asphalt	4.0"	3.0"
WYDOT Grading W	6.0"	8.0"
Base		
Reconditioned Native	8.0"	8.0"
Subgrade		
Rigid Pavement		
Portland Cement	6.0"	5.5"
Concrete		
Reconditioned Native	6.0"	6.0"
Subgrade		
Maximum Joint Interval	12 feet	12 feet

1. Asphalt Pavement materials should meet applicable requirements of Wyoming Department of Transportation, Specifications for Road and Bridge Construction, 2010 Edition, Section 401, 804, and 803.5. The asphalt concrete should be placed in maximum 3-inch thick compacted lifts.

2. Tack coats conforming to Section 407 are recommended between lifts. Maximum size aggregate of 1/2 inch should be used for the upper lift. Either 1/2 inch or 3/4 inch maximum size aggregate may be used for the lower lifts.

3. Reconditioned native pavement subgrades should be scarified to a minimum depth of 8 inches, moisture conditioned and compacted as described in the Earthwork Section. Prior to placing any aggregate base or pavement, the subgrade should be proof rolled and any soft spots improved.

4. Portland cement concrete materials should meet the requirements of the Wyoming Department of Transportation, Specifications for Road and Bridge Construction, 2010 Edition. Four to 6 percent air entrainment is recommended for concrete exposed to weather and for concrete workability. Steel reinforcement is not required within the pavement. However, dowels should be provided across construction joints to transfer loads and resist pavement displacement. Dowels should have sufficient diameter and spacing to transfer vertical loads, while allowing horizontal movement due to expansion and contraction of the concrete pavement.

5. For unreinforced, concrete pavement, joints should be placed so that slab panels are as square as possible. Contraction joints should have a maximum width of ¼ inch and be cut at least ¼ of the depth of the concrete. Contraction joints can be either tooled or saw cut. Expansion joints should be placed at the ends of the valley pans and between the pavement and curbs or walls. Expansion joints should have a minimum width of ½ inch. All contraction

and expansion joints should be filled with a field molded sealant to prevent the infiltration of water into the underlying soils.

6. This report is not intended to provide sufficient information for detailing joints for complex pavements. Joint requirements are dependent on concrete materials and the geometry of the pavement. Joint details can be critical to the performance of a project and should be designed by knowledgeable professionals.

7. Provisions should be made to periodically observe the conditions of the pavements and perform maintenance on cracks and joints, as required. Observed drainage problems should be promptly remedied. A primary focus of the pavement maintenance plan is to prevent subgrade soils from becoming wet.

3.6 RETAINING WALLS

Condition	Native Sand or Gravel	Grading A Fill
Active Lateral Soil Pressure – for structures that can deflect without restraint by other structures. (equivalent fluid unit weight, pcf)	42	38
At-Rest Lateral Soil Pressure - for structures which have significant restraint against deflection. (equivalent fluid unit weight, pcf)	63	59
Passive Lateral Soil Pressure – resistance of soil abutting a structure. (equivalent fluid unit weight, pcf)	375	407
Coefficient of Friction between foundation and underlying soil	0.4	0.5
Soil Density, wet soil (pcf)	125	125

1. All of the parameters assume the structure and soils are above the water table. The following parameters do not include a factor of safety. A minimum factor of safety of 2.0 is recommended for horizontal loading.

2. Where possible, foundations should be backfilled and compacted evenly on all sides to prevent horizontal movement. Basement/crawl space walls and retaining walls should be adequately braced prior to backfilling.

3. Surcharge loads, on the uphill side of the wall, due to ground slope, soil stockpiles, equipment, and structures may significantly increase lateral forces on the wall and need to be fully evaluated.

4. Drains should be installed behind retaining walls or other confined areas where surface precipitation and runoff water can collect. Drains should be designed to prevent the build-up of hydrostatic pressures behind the retaining structures due to trapped water.

3.7 SITE SEISMIC CONSIDERATIONS

Faults

The subject site is located within the Wind River Basin, and along the northeast flank of the Wind River Range. A thrust fault extends parallel to the slope and is partly concealed where it crosses approximately through Lander and a few miles south of the site. The fault is associated with uplift of the Wind River Range, coinciding with the lines of formational changes in sedimentary bedrock that form the mountain flank. This fault is not mapped as a Quaternary (recent) fault and has no known recurrence interval for seismic movement. The nearest Quaternary fault is the Continental Fault located approximately 40 miles south of the site. The Continental Fault does not provide enough evidence to categorize it as an earthquake source. The South Granite Mountain Fault System, located approximately 60 miles east of the site includes segments with evidence of Quaternary seismic activity, and with estimated recurrence intervals of 4,500 to greater than 12,000 years.

Potential for Earthquake Damage

The site is mantled by a thin (approximately 10 feet thick) layer of variably fine to coarse alluvium (overburden), which is saturated in places. Alluvium is immediately underlain by sedimentary bedrock consisting primarily of claystone. Neither strata are particularly vulnerable to deformation from ground motion either because soils do not have critical permeability for liquefaction to occur, or are not saturated, or when saturated are too thin or dense for significant deformation.

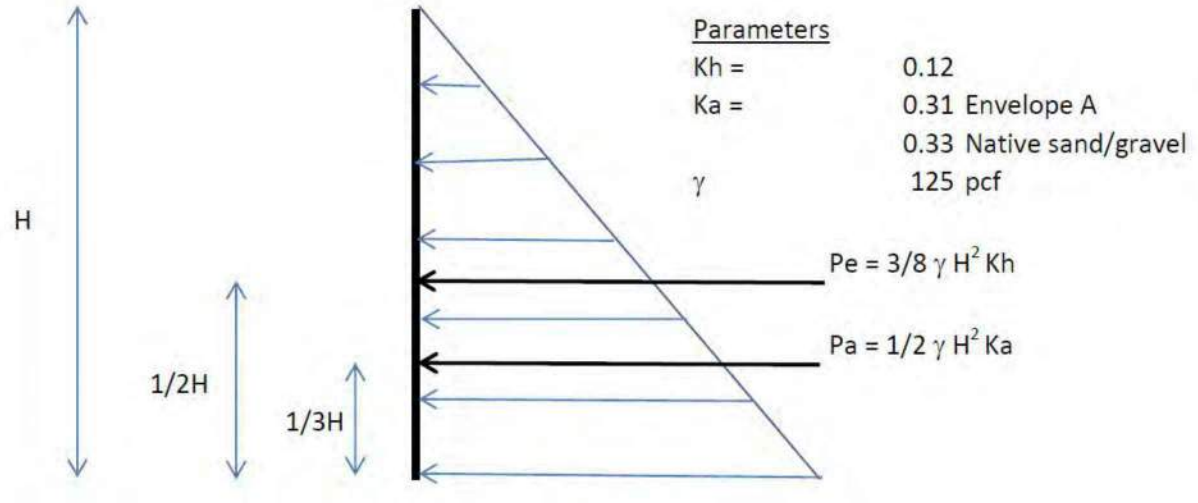
Design for Ground Movement

Inberg-Miller Engineers performed geophysical testing of the site via Multi-Channel Analysis of Surface Waves (MASW) methods. A transect was placed using 24 geophones spaced at 10-foot intervals through the approximate center of the project, and along Center Street within the WLRC facility. Average shear wave velocity was recorded for the two principal strata as follows:

Overburden	0 to 10 feet	840 ft/sec	Stiff Soil
Sedimentary Bedrock	10 to 67 feet	675 ft/sec	Stiff Soil
Sedimentary Bedrock	67 to 100 feet	1310 ft/sec	Soft Rock

Average shear wave velocity through 100 feet below ground surface is approximately 900 ft/sec. This shear wave velocity corresponds to a seismic Site Class D according to ASCE 7-10.

According to a map entitled Peak Horizontal Acceleration for the Conterminous United States (with 7 percent probability of exceedance in 75 years), we recommend a peak horizontal acceleration of 12% g for the site location. We recommend a corresponding addition for earthquake load per foot of wall length (Pe) to load due active soil pressure per foot of wall length (Pa) according to the following diagram.



3.8 DRILLED PIERS

Layer	A	B
Stratum Description	Overburden	Sedimentary Bedrock
Depth to Top of Layer	0 feet	--
Depth to Bottom of Layer	7.5 feet	>31.5 feet
Minimum Overall Pier Length (ft)	n/a	20 ft. below final site grade
Embedment Layer	no	yes
Minimum Embedment Depth (ft)	n/a	10
Minimum Diameter	18 inches	18 inches
Void Form Below Grade Beam/Cap (Y/N)	yes	yes
Minimum Frost Protection Depth (ft)	4.0	4.0
Allowable Skin Friction (compression) PSF	200	1000
Allowable Skin Friction (tension) PSF	100	500
Allowable End Bearing PSF	n/a	15,000
Estimated Settlement Total (in) Differential/Span (in/ft)	n/a	 0.50 0.25/50
LPILE Material Type	3	3
Total Unit Weight (pcf)	125	125
Friction Angle (deg)	--	--
Undrained Cohesion c (psi)	4.0	14.0
Unconfined Compressive Strength (psi)	8.0	28.0
Static Soil Modulus, k (pci)	500	1500
Young's Modulus, (psi)	--	--
Strain, k_m	--	--
Rock Quality Designation (RQD %)	--	--

* Refer to bedrock topographic map in Appendix A

1. All loose soils and cuttings that accumulate in the bottom of the pier excavation should be removed prior to concrete placement. The importance of achieving clean pier excavation bottoms prior to concrete placement cannot be overemphasized.

2. Groundwater that enters the pier hole may require control with casing. Groundwater may be removed with a bucket drilling attachment, pumped out, or displaced with tremied concrete. In any case, concrete must fill the hole completely to full diameter and depth and with a clean, sound contact to surrounding soil or rock.

3. Once drilling and cleaning is complete, the pier excavations should be observed by the Geotechnical Engineer, or his representative. If any additional drilling, cleaning, and/or dewatering are recommended by the Geotechnical Engineer, it should be performed prior to concrete placement. If pier excavations cannot be cleaned to the satisfaction of the Geotechnical Engineer, or his representative, the recommended allowable end bearing pressures may no longer be valid at those foundation locations.

4. Once drilling, cleaning, and/or dewatering of the excavations are sufficiently complete according to Item 1 and 2 above, concrete should be placed immediately.

5. Cast-in-place concrete piers should fill the entire hole. Falling concrete should be directed so that it does not come in contact with the sidewall of the excavation and so that it has minimal contact with reinforcing steel. Concrete may need to be placed with a tremie or concrete pump, especially if groundwater is present in the hole.

6. Concrete placed in pier excavations should have a slump of 6 to 8 inches, while at the same time maintaining minimum 28-day strength requirements. The concrete piers should fill the entire hole. If casing is used, it should be left in place until it has been filled with a sufficient head of concrete to prevent water infiltration, soil sloughing or creation of voids when it is withdrawn.

Vertical Pier Design Parameters

Pier Group Design Recommendations

Reduction in pier capacity due to group interaction

Number of Piers in Group	Spaced at 2 pier diameters measured center to center	Spaced at 3 pier diameters measured center to center
4	25 %	10 %
9	35%	15 %
16	50 %	25 %

1. Piers should not be placed closer than 2 pier diameters (measured center to center) apart.

2. Zero (0) % reduction applies to piers spaced at 4 pier diameters (measured center to center) or wider.

3. Linearly interpolate pier capacity reduction as needed for pier numbers and spacing other as provided.

3.9 HELICAL SCREW PILES

Helical screw piles are intended to transfer the structural loads through the compressible overburden to the underlying sedimentary bedrock. Helical screw piles offer an advantage of limiting excavation depths, and reducing or eliminating dewatering requirements. However, helical screw piles should be installed carefully, accurately, vertically (plumb) and sufficiently

embedded in the bearing stratum to develop full and proper potential for building support. We recommend selecting an experienced, competent specialty contractor for the purpose of designing, supplying and installing helical screw piles.

The following design and construction recommendations are provided to guide the process.

Minimum Shaft Diameter (in)	**4.5 (tube with 0.337 " wall thickness)**
Minimum Helix Diameter (in)	10.0
Helix Plate Thickness (in)	0.50
Recommended Bearing Strata	Claystone (see Bedrock Topo Map in Appendix A)
Minimum Length Below Final Site Grade (ft)	20
Depth for Grade Beam/Cap Frost Protection (ft)	4.0
Estimated Settlement	
Total (in)	1.0
Differential/Span (in/ft)	0.5

1. The pile-installing contractor should be prepared to adjust pile lengths if additional penetration becomes necessary or if adequate capacity is achieved at shallower depths. It is imperative that piles extend fully to the sedimentary bedrock stratum and not be terminated at shallower depths based on installation torque.

2. Steel helical piles should meet minimum yield strength of 95,000 lb/in^2 for shaft steel and 80,000 lb/in^2 for helix steel. Galvanization should meet requirements outlined in ASTM-A153 *Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware*.

3. We recommend a pile spacing of not less than 3.0 times the diameter of the largest helix measured from the shaft center to shaft center of the piles.

4. Piles should be spaced evenly and symmetrically. A load transferring device should be constructed over all piles at each column location and/or grade beam support. The device should be designed such that the anticipated load imposed is uniformly distributed to each pile. The structural design of the load-transferring device should be performed by a structural engineer.

5. The actual design of the piles including the pile capacity, spacing, helix diameter (s), shaft length, bracket attachment and configuration, and shaft diameter should be performed by an experienced screw pile contractor or structural engineer.

6. Helical piles shall be installed using equipment with a rotary type motor and be capable of meeting torque requirements for the pile design in either forward or reverse directions. Percussion drilling is not recommended. Equipment should be capable of applying axial compression (crowd) pressure and torque simultaneously.

7. Grade beams should be designed to transfer, in a uniform manner, all loads carried on the grade beam span to the helical pile. Air voids beneath grade beams can be provided by using commercially available collapsible cardboard forms ("J voids").

8. We do not recommend using vertically installed screw piles to resist lateral loads without approved lateral load test data, as these types of foundations are typically designed to resist axial loads, exclusively (compression and tension loads). Screw piles installed at a batter may be used to resist lateral loads. Typically, screw piles can be installed to a batter of up to 45 degrees from the horizontal. Only the horizontal component of the allowable axial load should be considered to resist the lateral loading and only in the direction of the batter.

3.10 GENERAL

Cement Type	**Type I/II**
International Building Code Seismic Site Class	D (refer to attached geophysical report)
Site Surface Drainage	Protect excavations from stormwater run-off, and direct water to surrounding terrain using best management practices for erosion control
Seepage Protection	Perimeter drains required for below grade spaces per detail below
Landscaping and Irrigation	Not recommended where shallow spread footings or slabs on grade are within 5 feet of subsurface clay/claystone

Inberg-Miller Engineers should review final plans and specifications in order to determine whether the intent of our recommendations has been properly implemented. In addition, we should be retained as the geotechnical engineer and construction materials testing agency to provide the following services:

a. Observe excavations to determine if subsurface conditions revealed are consistent with those discovered in the exploration.

b. Identify if the proper bearing stratum is exposed at proposed foundation excavation depths.

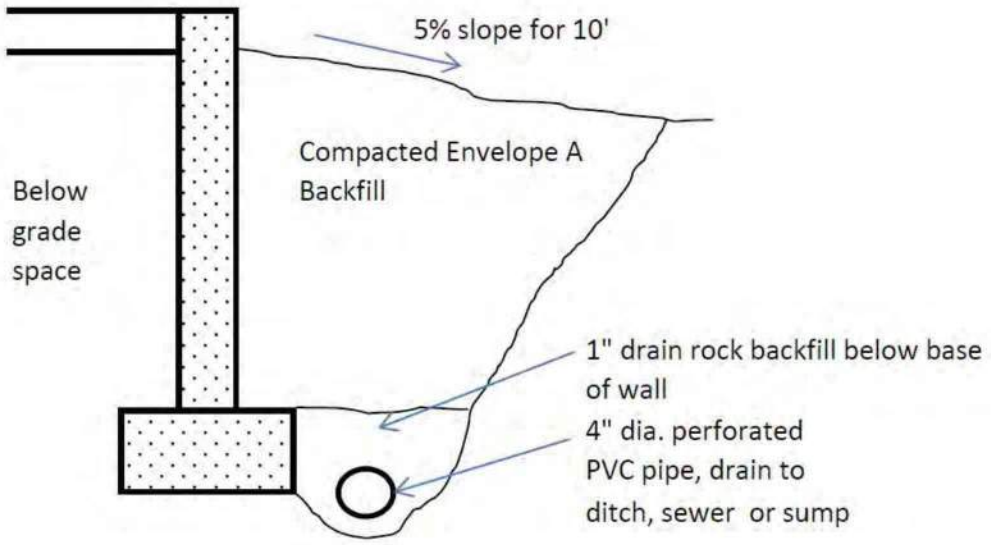
c. Observe that foundation excavations are properly prepared, cleaned, and dewatered prior to concrete placement.

d. Test compaction of subgrades and fills.

e. Perform field and laboratory testing of concrete and other materials as required by project specification and/or building code.

3.11 CONSTRUCTION

Excavation Difficulty	Low to moderate
Dewatering Requirements	Moderate flows expected in some areas (B9 and B19) at less than 10 feet below ground surface
Soil Moisture Sensitivity	Clay comprises some excavated soils and will require careful moisture control for stable conditions and compaction where acceptable for re-use as fill
Site Drainage	Perimeter drains required for below grade spaces per detail below
OSHA Soil Type	C
Casing Requirements for Drilled Shafts	Required through overburden
Potential for Buried Obstructions	Potential exists due to developed site history and many existing buried utilities and drains
Protection of Existing Structures	Excavations should not extend closer to existing foundations than twice the depth below the base of existing footings without shoring or support design by a structural engineer
Onsite Borrow Soil	Limited availability depending on clay content. Note presence of petroleum contamination (with undetermined level or lateral extent) at test boring B5



PERIMETER DRAIN DETAIL

4.0 TECHNICAL DATA

Our Site and Boring Location Map, Test Boring Logs, and Testing Data (laboratory reports, infiltration, geophysical) are included in Appendix A.

5.0 STANDARD REPORT INFORMATION

Our Standard Report Information, including Terms and Definitions, Field and Laboratory Testing Program, Limitations, and Comments Form are included in Appendix B.

6.0 CLOSURE

This report has been prepared for the exclusive use of our client, Wyoming Department of Health, for evaluation of the site, design, and construction planning purposes of the described project. All information referenced in the Table of Contents, as well as any future written documents that address comments or questions regarding this report, constitute the "entire report". Inberg-Miller Engineers' conclusions, opinions, and recommendations are based on the entire report. This report may contain insufficient information for applications other than those herein described. Our scope of services was specifically designed for and limited to the specific purpose of providing geotechnical recommendations for the design of the proposed Wyoming State Hospital expansion project. Consequently, this report may contain insufficient information for applications other than those herein described.

The scope of services for this project does not include any environmental or biological assessment of the site. If requested, we would be pleased to assist you with developing a scope of services for environmental assessment for the subject site. Wherever structures are in contact with soil, there is potential that soil moisture may penetrate the building and provide an opportunity for mold growth. While this report identifies soil moisture/groundwater conditions and may provide geotechnical recommendations for drainage and construction, the design of drains, water proof/resistant building elements, equipment to remove moisture from the building, or additional measures to prevent the growth of mold are beyond the scope of our geotechnical services. Implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent the growth of mold in or on the proposed building.

We caution that this report was not written as a construction contract document, and therefore should either not be incorporated in contract documents or be accompanied by a statement similar to the following:

This report was used during the planning and design of the subject project, and is provided in the contract documents for informational purposes only. This report may contain recommendations that were not implemented and terms that conflict with the contract documents, therefore the project plans and technical specifications and not this report should be followed for construction requirements.

We appreciate participating in your project. We can offer services under a separate contract to provide civil or environmental engineering services, review final plans and specifications, perform construction surveying, field and laboratory construction materials testing, and observe excavations, as may be required. Please call us at 307-875-4394 if you have any questions regarding this report.

APPENDIX A

SAMPLE AND DATA COLLECTION INFORMATION

Field-sampling techniques were employed in this exploration to obtain the data presented in the Final Logs and Report generally in accordance with ASTM D420, D1452, D1586 (where applicable), and D1587 (where applicable).

The drilling method utilized in most test borings is a dry-process, machine rotary auger type that advances hollow steel pipe surrounded by attached steel auger flights in 5-foot lengths. This method creates a continuously cased test hole that prevents the boring from caving in above each level of substrata to be tested. Sampling tools were lowered inside the hollow shaft for testing in the undisturbed soils below the lead auger. In some test borings, as appropriate to advance to the desired depth, air or wash rotary drilling methods were utilized. Air or wash rotary drilling methods allow for the extraction of rock core samples.

Samples were brought to the surface, examined by an IME field representative, and sealed in containers (or sealed in the tubes) to prevent a significant loss of moisture. They were returned to our laboratory for final classification per ASTM D2487 methods. Some samples were subjected to field or laboratory tests as described in the text of this report.

Groundwater observations were made in the open drill holes by IME field personnel at the times and dates stated on the Final Logs. Recorded groundwater levels may not reflect equilibrium groundwater conditions due to relatively low permeability of some soils. It must also be noted that fluctuations may occur in the groundwater level due to variations in precipitation, temperature, nearby site improvements, nearby drainage features, underdrainage, wells, severity of winter frosts, overburden weights, and the permeability of the subsoil. Because variations may be expected, final designs and construction planning should allow for the need to temporarily or permanently dewater excavations or subsoil.

A Final Log of each test pit or boring was prepared by IME. Each Final Log contains IME's interpretation of field conditions or changes in substrata between recovered samples based on the field data received, along with the laboratory test data obtained following the field work or on subsequent site observations. The final logs were prepared by assembling and analyzing field and laboratory data. Therefore, the Final Logs contain both factual and interpretive information. IME's opinions are based on the Final Logs.

The Final Logs list boring methods, sampling methods, approximate depths sampled, amounts of recovery in sampling tools (where applicable), indications of the presence of subsoil types, and groundwater observations and measurements. Results of some laboratory tests are arrayed on the Final Logs at the appropriate depths below grade. The horizontal lines on the Final Logs designate the interface between successive layers (strata) and represent approximate boundaries. The transition between strata may be gradual.

We caution that the Final Logs alone do not constitute the report, and as such they should not be excerpted from the other appendix exhibits or from any of the written text. Without the written report, it is possible to misinterpret the meaning of the information reported on the Final Logs. If the report is

reproduced for reference purposes, the entire numbered report and appendix exhibits should be bound together as a separate document, or as a section of a specification booklet, including all drawings, maps, etc.

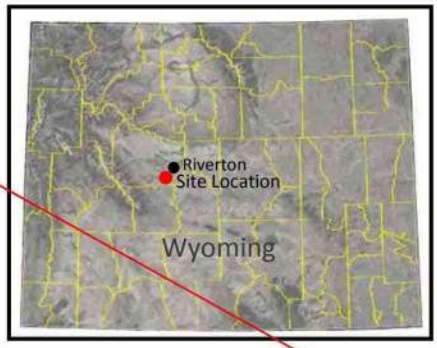
Pocket penetration tests taken in the field, or on samples examined in the laboratory are listed on the Final Logs in a column marked “qp". These tests were performed only to approximate unconfined strength and consistency when making comparisons between successive layers of cohesive soil. It is not recommended that the listed values be used to determine allowable bearing capacities. Bearing capacities of soil is determined by IME using test methods as described in the text of the report.

Site Location and Test Boring Location Map



INBERG-MILLER ENGINEERS
IME
QUALITY SOLUTIONS THROUGH TEAMWORK
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N





Project #: 18839-GX Date(s) Drilled: December 19-22, 2016

Sources: Google Maps and Google Earth Pro

TEST BORING B-1

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84246°, 108.71001°

Job No.: 18839-GX
Client: WDOH

Surface Elevation (Ft): 5370.0

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT (PL / LL)	OTHER TESTS AND NOTES
5370	0	Medium dense to very dense, dry, light brown, fine to coarse silty SAND and GRAVEL			55	1	36	63	11		W.S.S. = 0-50ppm
					13				10		
5365	5				25				10		
		Cobbles at 7.5'			33				8		
5360	10				50/5"				4		
		15.0									
5355	15	Hard, wet, brown, CLAY with some fine to coarse sand (claystone)			30				21		
5350	20				50/5.5"				19		
5345	25				50/5.5"				17		
		26.5									

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) 15

End of Drilling(ft) 15

Depth to Cave In (Ft): 21.8

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-2

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84278°, 108.70945°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5373.0			0 50 100				0 20 40 60		
	0	Hard to stiff, dry, pink to light brown, gravelly, sandy CLAY			44				15		
5370		Grades moist, without gravel at 2.5'			13				22		
	5								7		
		Medium dense, moist, white to light brown, clayey sand with fine to coarse GRAVEL									
		7.5									
5365		Medium dense, moist, light brown, fine SAND			21				2		
	10	Grades with fine to coarse gravel at 10'			25				8		
5360											
		15.0									
	15	Very stiff to hard, moist, dark brown, sandy CLAY (claystone)			23				18		
5355											
	20				30				15		
5350											
	25				55				14		
		26.5									

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 15.4

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-3

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84262°, 108.70905°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5371.0			0 50 100					0 20 40 60	
5370	0	Medium dense, moist, light to dark brown, clayey SAND			16					27	
	3.0				11					26	
		Firm, moist, pink sandy CLAY with sand interbeds			5					14	-200 = 52.37%
5365	5										
	7.5				37					5	
		Dense, moist, white to light brown, sandy, fine to coarse GRAVEL									
	10				10					23	
5360	11.0										
		Stiff to hard, moist, dark brown to black, sandy CLAY (claystone)									
5355	15									17	
	20				23					17	
5350											
	25										
5345	26.5				45					16	

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 16

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-4

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84227°, 108.70913°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5368.5									
	0	Very stiff to hard, dry, brown, CLAY with some gravel			30, 32				15, 11		
5365	5	Some fine to coarse sand, gravel and cobbles at 5'			41				8		
	7.5	Very stiff to hard, moist, brown, sandy CLAY (claystone)			17				19		-200 = 2.83% LL= 47 PL= 19 PI= 28
5360	10				28				17		
5355	15				38				18		
5350	20				53				19		
5345	25				50/5"				15		
	26.5										

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 19.8

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-5

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84206°, 108.70938°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5369.5			0 50 100					0 20 40 60	
	0	ASPHALT Pavement 0.5			28					19	
		Medium dense, moist, light to dark brown, gravelly sandy CLAY									
		2.5									
		Soft, moist, tan, sandy CLAY			7					22	-200 = 32.25%
5365	5									16	LL= 35
											PL= 19
											PI= 16
		7.5									
		Dense, moist, light brown to black, silty, sandy fine to coarse GRAVEL (with petroleum odor)			39					10	
5360	10	10.0									
		Stiff to hard, moist, light to dark brown, sandy CLAY (claystone)			17					17	
5355	15										
					22					16	
5350	20				47					14	
5345	25										
		26.5			65					16	

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 17.2

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-6

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84167°, 108.71004°

Job No.: 18839-GX
Client: WDOH

Surface Elevation (Ft): 5370.5

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION
5370	0	Medium dense to very dense, moist, white to light brown, sandy GRAVEL
		Grades to clayey gravel below 2.5'
5365	5	
	8.0	
		Stiff to hard, moist, dark brown, sandy CLAY (claystone)
5360	10	
5355	15	
5350	20	
5345	25	
	26.5	

GRAPHIC / SAMPLE TYPE RECOVERY

N BLOWS PER Ft: 0 50 100

50/3", 18, 68, 12, 23, 21, 57

Qp (TSF)

% GRAVEL

% SAND

% -200

WATER CONTENT: PL LL

0 20 40 60

9, 9, 6, 18, 13, 14, 11, 13

OTHER TESTS AND NOTES

-200 = 23.38%

LL= 31
PL= 16
PI= 15

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 14.9

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-7

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84134°, 108.71043°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5371.0			0 50 100					0 20 40 60	
5370	0	Dense, moist, white to light brown, clayey SAND			40					17	
	2.5	Very dense, moist, gravelly SAND Grades gravelly sand at 2.5'			45					7	
5365	5				50/1"					4	
	7.5	Very stiff to hard, moist, dark brown, sandy CLAY (claystone)			27					14	
5360	10				27					13	
5355	15				25					13	
5350	20				48					13	
5345	25				58					12	
	26.5										

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 17.1

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-8

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84101°, 108.71072°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5372.5									
5370	0	Very stiff, dry, brown, CLAY with coarse gravel			29				17		
		Turning to a silt with coarse gravel							11		
	5.0										
5365	5	Very dense, dry, light brown, fine to coarse SAND and GRAVEL, cobbles			74				3		
					67				8		
	10.0										
5360	10	Very stiff to hard, dry, dark brown CLAY (claystone)			28				16		
	15				48				14		
5355											
	20				72				16		
5350											
	25				50/5"				15		
	26.5										

0 50 100 (N BLOWS PER Ft) — 0 20 40 60 (WATER CONTENT)

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 23.9

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-9

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84101°, 108.711°

Job No.: 18839-GX
Client: WDOH

Surface Elevation (Ft): 5374.0

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
5374	0	Hard, dry, brown, CLAY with some fine to coarse sand and gravel			31, 30				10, 12		W.S.S. = 0-50ppm
5370	5	Very dense to dense, dry, light brown, fine to coarse SAND and gravel			50/3", 30				3, 9		-200 = 63.91%
		Wet below 7.5'									LL= 35
5365	10	Very stiff to hard, dry, brown, CLAY with silt (claystone)			29, 38				17, 16		PL= 17
5360	15										PI= 18
5355	20				50/5.5"				26		
5350	25	Dry at 25'			50/5"				17		
	26.5										

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) 7.5
End of Drilling(ft) 15

Depth to Cave In (Ft): 19.8

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-10

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84061°, 108.71152°

Job No.: 18839-GX
Client: WDOH

Surface Elevation (Ft): 5376.5

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
5375	0	Hard, dry, brown, silty CLAY			39, 31				23, 16		
	2.5	Medium dense to very dense, dry, brown, fine to coarse SAND and gravel with cobbles			54, 61				3, 5		
5370	5	Very dense below 5'									
	10.0	Very stiff to hard, dry, brown CLAY (claystone)			24, 26				15, 16		
5365	10										
5360	15				64				14		
5355	20										
5350	25				50/5"				14		
	26.5										

0 50 100 (N BLOWS PER Ft)

0 20 40 60 (WATER CONTENT)

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

☒ Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 23.8

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-11

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84018°, 108.71175°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5375.0			0 50 100					0 20 40 60	
5375	0	Dense to hard, dry, dark brown, CLAY			50/5"					15	W.S.S. = 0-50ppm
		2.5			50/1"					6	
		Medium dense to very dense, dry, light brown, silty fine to coarse SAND and GRAVEL with cobbles									
5370	5				38	6	84	10		3	
					21					18	
		10.0									
5365	10	Very stiff to hard, dry brown CLAY (claystone)								15	
5360	15				29					17	
5355	20				59					17	
5350	25				50/5.5"					16	
		26.5									

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 23.6

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-12

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84013°, 108.71218°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5377.0			0 50 100					0 20 40 60	
	0	Hard, dry, brown, CLAY with some fine to coarse sands			32					22	
5375											
	2.5	Very dense, dry, light brown, fine to coarse SAND and GRAVEL			70					7	
	5	Cobbles at 5'			82					5	
5370					50/2"					6	
	10.0										
	10	Very stiff to hard, dry, dark brown CLAY (claystone)			28					17	
5365											
	15				30					18	
5360											
	20				50/5"					16	
5355											
	25				50/5"					15	
	26.5										
5350											

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 20

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-13

Project: WY Life Resource Center
Location: Lander, Wyoming
42.83979°, 108.71213°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5375.0			0 50 100					0 20 40 60	
5375	0	Hard, dry, light gray, silty, fine to coarse, sandy CLAY			32					16	
		2.5									
		Medium dense, dry, light brown, fine to coarse, SAND and GRAVEL with some clay			22					12	
5370	5	5.2			50/2"						

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	5.2
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 4.5

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-14

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84104°, 108.71006°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5370.0									
5370	0	Dense, moist, light brown, gravelly SAND			44				10		
		0.5									
		Hard, moist, light to dark brown, sandy CLAY									
		2.5									
		Loose, moist, pink to light brown, fine SAND			5				8		
		5.0									
5365	5	Firm, moist, light brown sandy CLAY			11				20		
		6.5									

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	6.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 4.1

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-15

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84027°, 108.71068°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5370.0									
5370	0	Medium dense to very dense, dry, light brown, fine to coarse SAND and GRAVEL			0 50 100				0 20 40 60		
					62				8		
					14				10		
5365	5				15				9		
		6.5									

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	6.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 5.1

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-16

Project: WY Life Resource Center
Location: Lander, Wyoming
42.83961°, 108.70994°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5361.0			0 50 100					0 20 40 60	
	0	Firm, moist, light to dark, brown, sandy CLAY with some gravel			9					21	
5360											
	1.5	Medium dense, moist, tan to pink, sandy clayey GRAVEL			18	33	43	24		16	
	5										
	5.5	Stiff, moist, dark brown, sandy CLAY			15					19	
5355											
	6.5										

Remarks:

Date Begun:	12/19/16
Date Completed:	12/19/16
Termination Depth (ft):	6.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 3

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-17

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.83983°, 108.70969°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5359.5			0 50 100					0 20 40 60	
	0	Medium dense, moist, light to dark brown, clayey SAND with some gravel			12, 7				14		
		2.0									
		Soft, moist, light pink to tan, sandy CLAY							19		
		4.0									
5355	5	Medium dense, moist, white, light brown sandy GRAVEL			15, 19				13, 16		
		6.0									
		Medium dense, moist, dark brown, clayey SAND									
5350		10.0									
	10	Stiff to hard, moist, brown, sandy CLAY (claystone)							16		-200 = .82% LL= 41 PL= 19 PI= 22
5345	15	Grades hard			35				15		
5340	20				28				17		
5335	25				43				15		
5330	30				60				14		
		31.5									

Remarks:

Date Begun:	12/19/16
Date Completed:	12/19/16
Termination Depth (ft):	31.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 15.1

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-18

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84°, 108.70941°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5359.0			0 50 100					0 20 40 60	
	0	Medium dense to very dense, dry, dark brown, fine to coarse, silty SAND, some gravel			24					27	
5355					65					7	
	5				68					5	
		6.5									

Remarks:

Date Begun:	12/19/16
Date Completed:	12/19/16
Termination Depth (ft):	6.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 2.5

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-19

INBERG-MILLER ENGINEERS — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.83994°, 108.71012°

Job No.: 18839-GX
Client: WDOH

Surface Elevation (Ft): 5363.0

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT (PL △ LL △)	OTHER TESTS AND NOTES
5363	0	Very stiff, dry, brown, CLAY with some coarse SAND			17, 18				19, 20		W.S.S. = 0-50ppm
	5.0										
	5	Very hard, moist, fine to coarse SAND and gravel			23		34	54	12, 8	12	SM LL= 0 PL= 0 PI= 0
	7.5										
5355		Very stiff to hard, wet, brown CLAY (claystone)			24				19		
	10										
5350											
	15				29				21		
5345											
	20				57				26		
5340											
	25				50/5"				18		
	26.5										

Remarks:

Date Begun:	12/19/16
Date Completed:	12/19/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	7.5
End of Drilling(ft)	5

Depth to Cave In (Ft): 17.5

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-20

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84016°, 108.70985°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5362.5			0 50 100					0 20 40 60	
	0	Medium dense, dry, brown, clayey, coarse to fine SAND and GRAVEL			28					30	
5360	2.5	Very stiff, dry, dark brown, CLAY with fine to coarse gravel			24					14	
	5.0										
	5	Dense, dry, brown, fine to coarse, silty SAND			42					16	
5355	7.5	Very stiff to hard, dry, brown, silty CLAY (claystone)			32					16	
	10				31					15	-200 = 1.13% LL= 45 PL= 19 PI= 25
5350											
	15				35					16	
5345											
	20				54					14	
5340											
	25				50/5.5"					16	
	26.5										

Remarks:

Date Begun:	12/19/16
Date Completed:	12/19/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 19.5

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-21

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.8413°, 108.70926°

Job No.: 18839-GX
Client: WDOH

Surface Elevation (Ft): 5365.5

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
5365	0	Very dense, moist, white to light brown, sandy GRAVEL			50/5"				12		
	4.5	Stiff, moist, dark brown, sandy CLAY			23				12		
5360	5				17				12		
	6.5										

N BLOWS PER Ft: 0 50 100
% -200: 0 20 40 60

Remarks:

Date Begun:	12/19/16
Date Completed:	12/19/16
Termination Depth (ft):	6.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A
End of Drilling(ft) N/A

Depth to Cave In (Ft): 2.5

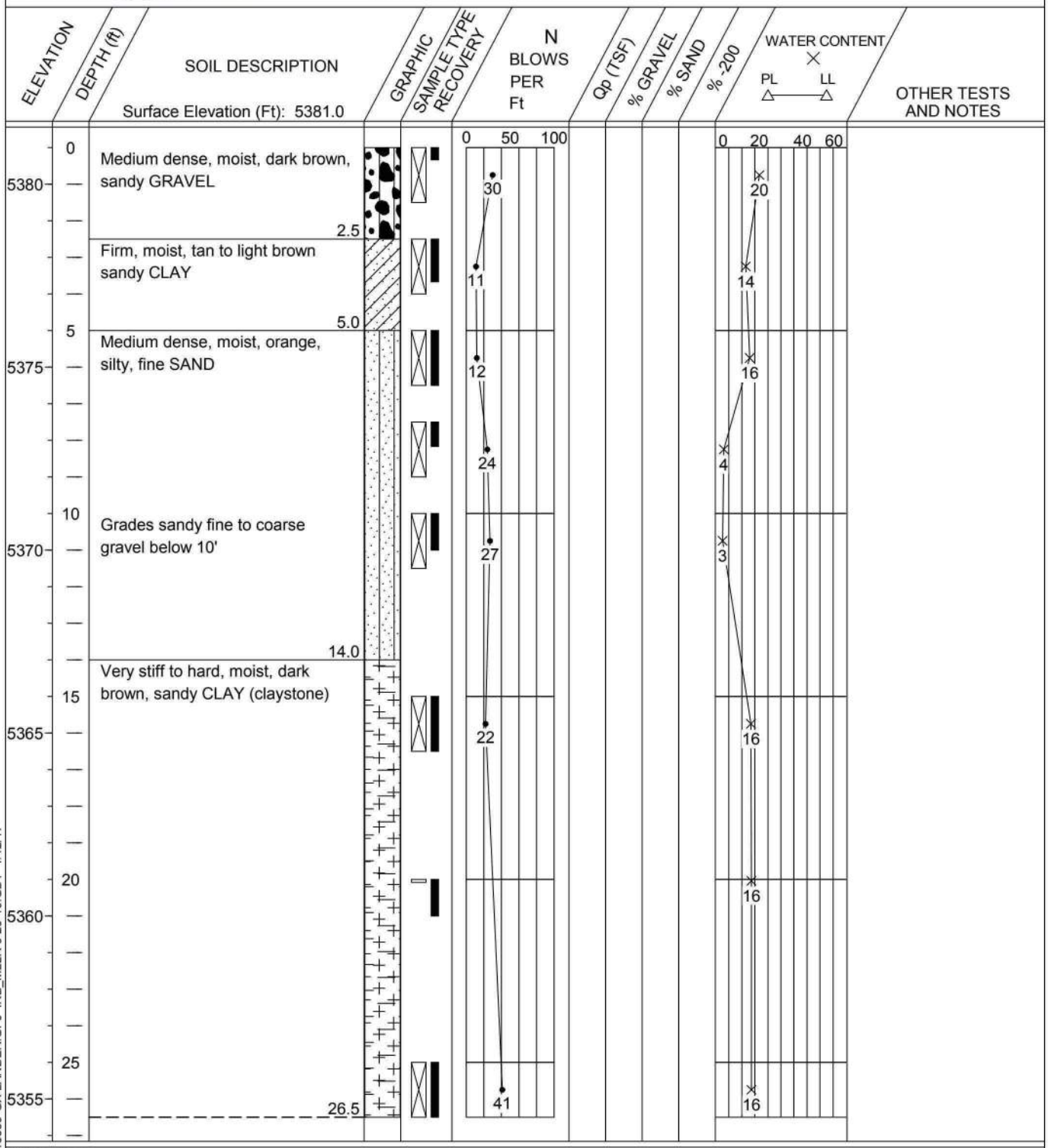
LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-22

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84077°, 108.71288°

Job No.: 18839-GX
Client: WDOH



Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 18

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-23

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84094°, 108.71334°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5377.5			0 50 100					0 20 40 60	
	0	Very dense, moist, dark brown, clayey, gravelly, SAND			55					24	
	1.5	Stiff, moist, tan to light brown, sandy CLAY									
5375					18					13	
	5				17					14	
	6.5										

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	6.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A
End of Drilling(ft) N/A

Depth to Cave In (Ft): 5

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-24

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84068°, 108.71348°

Job No.: 18839-GX
Client: WDOH

Surface Elevation (Ft): 5378.0

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
5378	0	Firm to very stiff, dry, brown, CLAY			22, 8				15, 12		
5375	5				28, 50/4"				3, 3		
5373.5	5.0	Medium dense to very dense, dry, brown, fine to coarse SAND and GRAVEL									
5370	10				24				4		
5365	15				23				20		-200 = 9.24% LL= 0 PL= 34 PI= -34
5363	15.0	Very stiff to hard, dry, brown, CLAY (claystone)									
5360	20				42				16		
5355	25				70				18		
5351.5	26.5										

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 14

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-25

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84066°, 108.71397°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5376.0			0 50 100					0 20 40 60	
	0	Hard, dry, brown, CLAY with some fine to coarse gravel			43				9		
5375					52				9		
	5	Dense, dry, light brown, fine to coarse SAND and GRAVEL			32				5		
5370											
		5.0									
		6.5									

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	6.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 5.6

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-26

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84025°, 108.71368°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5379.0									
	0	Very stiff, dry, brown, CLAY with some fine to coarse gravel			17, 50/5.5"				10, 4		
	2.5										
5375		Very dense, dry, light brown, fine to coarse SAND and GRAVEL with cobbles at 4'			50/3", 62				3, 2		
5370	10.0										
	10	Dense, wet, brown, fine to coarse SAND and GRAVEL			35				10		
5365	15.0										
	15	Hard, dry, brown, CLAY (claystone)			37				21		
5360					50				20		
5355	25				67				15		
	26.5										

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

☒ Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 9

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-27

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84097°, 108.71207°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5378.5			0 50 100					0 20 40 60	
	0	Medium dense, moist, light to dark brown, clayey SAND			21					13	
		2.5									
5375		Stiff to very stiff, moist, tan, sandy CLAY			29					14	
	5				11					13	-200 = 22.32%
											LL= 31
											PL= 15
		7.5									PI= 16
5370		Medium dense to very dense, moist, orange to dark brown, fine SAND			31					6	
	10	Grades silty			48					3	
5365											
		15.0									
	15	Very stiff to hard, moist, dark brown, sandy CLAY (claystone)			24					15	
5360											
	20				49					14	
5355											
	25				49					15	
		26.5									

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

☒ Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 17.7

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-28

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84135°, 108.71144°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5375.5			0 50 100					0 20 40 60	
5375	0	Very stiff, dry, brown, silty CLAY with some fine to coarse gravel			18, 16				11, 10		
	5.0										
5370	5	Very dense, dry, light brown, fine to coarse SAND and GRAVEL			48, 40				4, 5		
5365	10				47				6		
	15.0										
5360	15	Very hard, dry, brown, CLAY (claystone)			34				14		
5355	20				73				12		
5350	25				50/5"				13		
	26.5										

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 21

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-29

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84146°, 108.71123°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5375.5									
5375	0	Medium dense, moist, light to dark brown, clayey SAND			28, 11				20, 13		
		Grades with some gravel									
	5.0										
5370	5	Soft, moist, tan to dark brown, sandy CLAY			7, 50/4"				13, 5		
	7.5										
		Very dense, moist, white to orangish brown, sandy fine to coarse GRAVEL			56				6		
5365	10										
	15				27						
5360	16.0										
		Hard, wet, light to dark brown, sandy CLAY (claystone)			55				21		
5355	20										
5350	25				55				21		
	26.5										

0 50 100 — 0 20 40 60

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

☒ Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) 14
End of Drilling(ft) 11

Depth to Cave In (Ft): 21.2

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-30

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84183°, 108.71085°

Job No.: 18839-GX
Client: WDOH

Surface Elevation (Ft): 5374.5

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION
	0	Stiff to very stiff, dry, brown, CLAY with some fine to coarse gravel
5370	5	Cobbles at 5'
5365	10	10.0
		Very dense, dry, light brown, fine to coarse SAND and GRAVEL with cobbles
5360	15	15.0
		Hard, dry, brown, CLAY (claystone)
5355	20	
5350	25	26.5

GRAPHIC / SAMPLE TYPE RECOVERY

N BLOWS PER Ft: 0 50 100 — 20, 15, 21, 50/1", 67, 43, 61, 50/5"

Qp (TSF)

% GRAVEL

% SAND

% -200

WATER CONTENT: 0 20 40 60 — PL, LL — 9, 9, 13, 4, 12, 12, 11

OTHER TESTS AND NOTES

-200 = 42.11%

LL= 32
PL= 17
PI= 15

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 19.9

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-31

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.8422°, 108.71056°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5374.5									
5370	0–5	Stiff to very stiff, dry, brown, CLAY with some fine to coarse SAND and GRAVEL			23, 10, 12				14, 13, 14		-200 = 46.76%
	7.5										
5365	5–10	Very dense, dry, light brown, fine to coarse SAND and GRAVEL			51				6		
	10.0										
5360	10–15	Medium stiff, dry, light brown, CLAY with some fine to coarse SAND and GRAVEL			6, 32				16, 11		
	15.0										
5355	15–20	Hard, moist, brown, CLAY (claystone)			76				11		
5350	20–25				50/5"				12		
	26.5										

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	26.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

☒ Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 19.1

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-32

INBERG-MILLER ENGINEERS — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84198°, 108.71134°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5376.5									
5375	0	Medium dense, moist, light brown, clayey, gravelly, SAND			26, 29				13, >>		
	5.0										
5370	5	Soft, moist, light brown, sandy CLAY			5				16		
	7.5										
		Medium dense, moist, white to light brown, sandy GRAVEL									
5365	10	Grades with silt			26				5		
	13.5										
		Stiff, moist, dark brown, sandy CLAY (claystone)							12		
5360	15										
5355	20				62				>>		
5350	25				67				11		
	26.5										

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

- Standard Penetration Test
- Drive Sampler, 2.41-I.D.

WATER LEVEL OBSERVATIONS

While Drilling (ft)	N/A
End of Drilling(ft)	N/A

Depth to Cave In (Ft): 17.3

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-33

INBERG-MILLER ENGINEERS — IME — Quality Solutions Through Teamwork

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84214°, 108.71156°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5375.0			0 50 100					0 20 40 60	
5375	0	Medium dense, moist, dark brown sandy CLAY			21					17	W.S.S. = 0-50ppm
		0.5									
		Medium dense, moist, white to light brown, clayey, sandy GRAVEL			11					12	
		2.5									
		Firm, dry, tan to light brown, sandy CLAY									
5370	5	Grades moist with some red			9					15	-200 = 18.08%
		6.0									
		Medium dense, moist, white to light brown, sandy, fine to coarse GRAVEL			22					4	
5365	10				21					4	
5360	15	Grades with some silt			50/3"					7	
		16.0									
		Hard, moist, dark brown, sandy CLAY (claystone)									
5355	20				38					12	
5350	25				48					12	
		26.5									

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 14.6

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-34

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84202°, 108.71204°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5374.5									
	0	Medium dense, moist, dark brown, clayey SAND			20					10	
	1.0	Medium dense, moist, white to brown, sandy GRAVEL			22					6	
5370	5	Grades with silt			75					3	
					50/3"					2	
5365	10				50/5"					2	
	13.0	Stiff, moist, dark to light brown, sandy CLAY (claystone)			18					15	
5360	15										
5355	20				31					12	
5350	25				50/4"					12	
	26.5										

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	26.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 17.1

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-35

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84253°, 108.711°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5373.0			0 50 100				0 20 40 60		
	0	ASPHALT									
		0.5									
		Dense, moist, white to light brown, clayey, gravelly, SAND			46				8		
		2.5									
5370		Soft, moist, dark brown, sandy CLAY			6				13		
	5				6				19		
		6.5									

Remarks:

Date Begun:	12/21/16
Date Completed:	12/21/16
Termination Depth (ft):	6.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 4.1

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-36

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84314°, 108.70939°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5371.0									
	0	Hard, dry, brown, CLAY with some fine to coarse GRAVEL			0 50 100				0 20 40 60		
5370					29				11		
	1.5	Very dense, dry, light brown, fine to coarse SAND and GRAVEL									
					51				7		
	5										
					55				3		
5365											
	6.5										

Remarks:

Date Begun:	12/22/16
Date Completed:	12/22/16
Termination Depth (ft):	6.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

☒ Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 3.7

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-37

INBERG-MILLER ENGINEERS — IME — QUALITY SOLUTIONS THROUGH TEAMWORK

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84231°, 108.70955°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5372.0									
	0	ASPHALT									
		0.5									
		Dense, moist, light brown, clayey, gravelly SAND			37				9		
5370											
		2.5									
		Soft to firm, moist, tan, sandy CLAY			8				25		
	5	Grades dark brown at 5'			8				20		
		6.5									
5365											

0 50 100 (N BLOWS PER Ft)

0 20 40 60 (WATER CONTENT)

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	6.5
Crew:	TEJ, ATT, SDV
Rig:	Mobile B-57
Method:	4 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A

End of Drilling(ft) N/A

Depth to Cave In (Ft): 2.2

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17

TEST BORING B-38

Project: WY Life Resource Center
Location: Lander, Wyoming
42.84158°, 108.71046°

Job No.: 18839-GX
Client: WDOH

ELEVATION	DEPTH (ft)	SOIL DESCRIPTION	GRAPHIC	SAMPLE TYPE RECOVERY	N BLOWS PER Ft	Qp (TSF)	% GRAVEL	% SAND	% -200	WATER CONTENT PL LL	OTHER TESTS AND NOTES
		Surface Elevation (Ft): 5372.0									
	0	Hard, dry, brown, CLAY with some fine to coarse gravel			50/3"				7		
5370											
	2.5	Dense to very dense, dry, light brown, fine to coarse SAND and GRAVEL			46				8		
	5				50/5.5"				4		
	6.5										
5365											

Remarks:

Date Begun:	12/20/16
Date Completed:	12/20/16
Termination Depth (ft):	6.5
Crew:	DL, NDA
Rig:	Mobile B-57
Method:	3 1/4" Hollow Stem Auger
Benchmark/Datum (Ft):	

SAMPLE TYPES

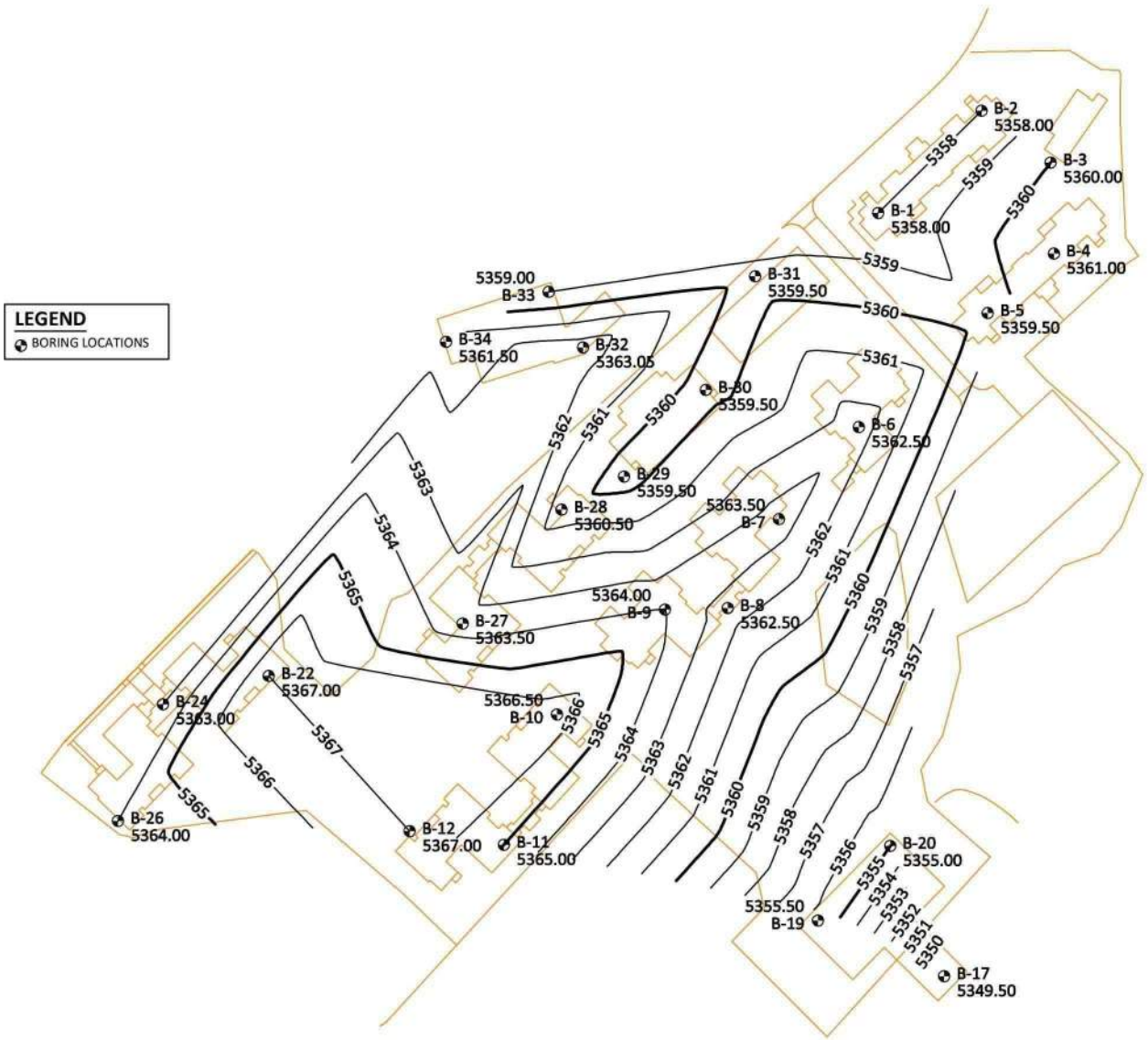
☒ Standard Penetration Test

WATER LEVEL OBSERVATIONS

While Drilling (ft) N/A
End of Drilling(ft) N/A

Depth to Cave In (Ft): 5

LOG OF TEST BORING OR TEST PIT 18839-GX LANDER.GPJ INB_MLLR 6-23-10.GDT 1/12/17



SCALE HORZ 1"=150' VERT	REVISIONS	INBERG-MILLER ENGINEERS					WYOMING LIFE RESOURCE CENTER STATE OF WYOMING	BEDROCK TOPO MAP LANDER, WY	SHEET G1.0
DRN. SDV BK: JOB NO. 18839-GX		124 East Main Street Riverton, WY 82501 307-856-8136	1120 East C Street Casper, WY 82601 307-577-0806	350 Parsley Boulevard Cheyenne, WY 82007 307-635-6827	193 West Flaming Gorge Way Green River, WY 82935 307-875-4394	830 E. Richards St Ste 1 Douglas, WY 82633 307-359-7000			
CHK. GMB PAGE: DATE: 1/13/2016									

Any use, reuse, or CADD adaptation of this drawing other than for the specific purpose intended, by anyone, without written authorization from the engineer, will be at the Client's risk and full legal responsibility.

FILE: 18839-GX STATE OF WYOMING Bedrock Map.dwg

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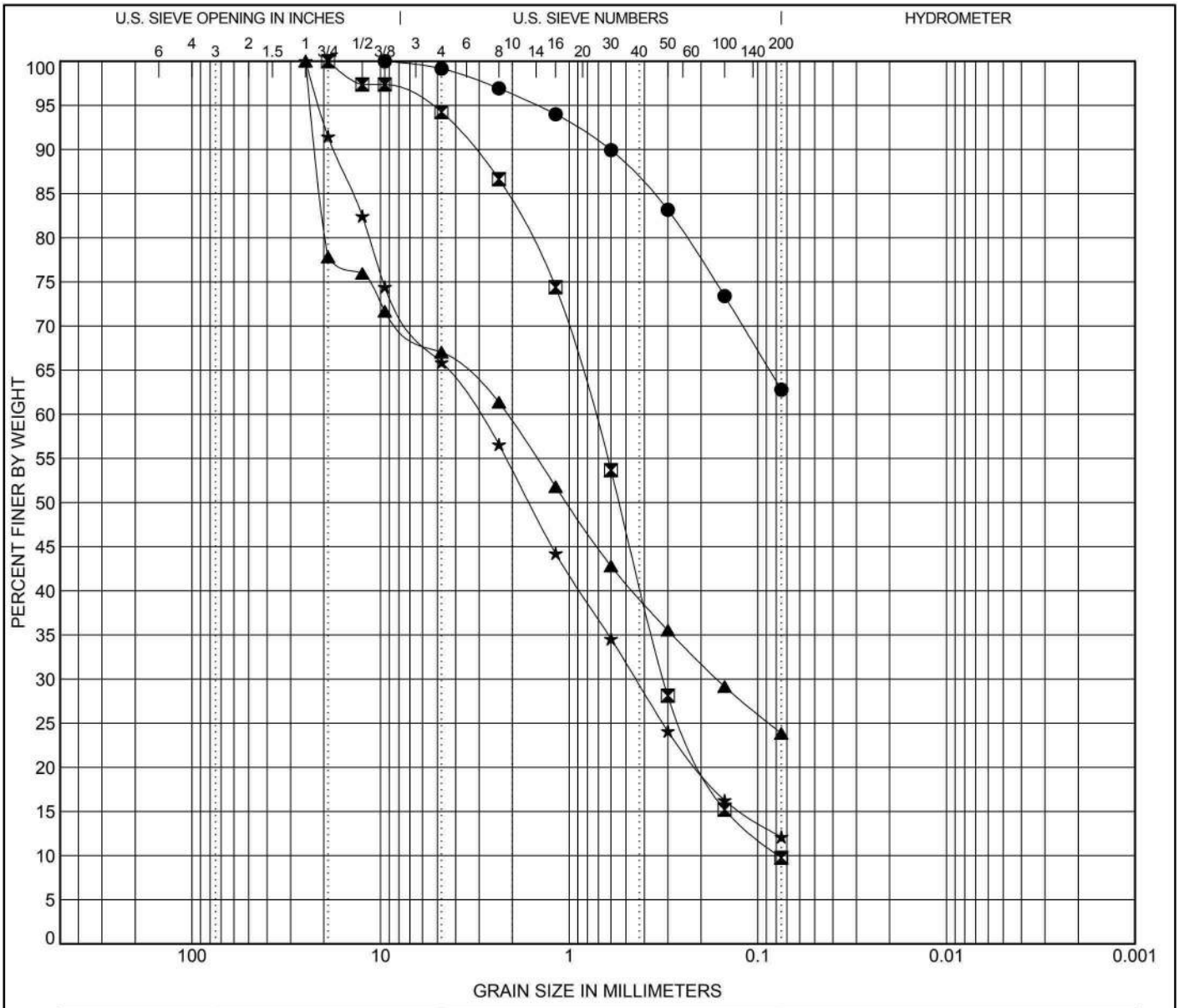
APPENDIX B

LABORATORY TESTING PROGRAM

Soil samples were transported to our laboratory where they were subject to further evaluation, which may include visual classification according to ASTM D2488 or other analysis to determine certain engineering properties. Tests were performed in accordance with the test methods listed below.

Laboratory Test	Test Method
Moisture Content	ASTM D2216
Liquid Limit, Plastic Limit and Plasticity Index	ASTM D4318
Sieve Analysis	ASTM C117
Sieve Analysis with Hydrometer	ASTM D422
Sieve Analysis (200 Sieve only)	ASTM D1140
Water Soluble Sulfate	Comparative
Unconfined Compressive Strength	ASTM D2166
Moisture-Density Relationship (Standard Proctor)	ASTM D698
Moisture-Density Relationship (Modified Proctor)	ASTM D1557
California Bearing Ratio (CBR)	ASTM D1883
Hydraulic Conductivity	ASTM D5084
Minimum Resistivity	AASHTO T288
pH	AASHTO T288
Tube Density	ASTM D2937
Direct Shear	ASTM D3080
Consolidation-Swell	ASTM D2435

Test results that are not displayed on the test boring logs are presented in Appendix B of this report.



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	B-1	2.5						
⊠	B-11	5.0					1.75	9.53
▲	B-16	2.5						
★	B-19	5.0	SILTY SAND with GRAVEL(SM)	NP	NP	NP	1.22	57.97

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-1	2.5	9.5				0.8	36.4	62.8	
⊠	B-11	5.0	19	0.738	0.316	0.077	5.8	84.5	9.8	
▲	B-16	2.5	25	2.139	0.165		33.0	43.2	23.9	
★	B-19	5.0	25	3.054	0.444		34.1	53.8	12.1	

PROJECT: WY Life Resource Center
JOB NO.: 18839-GX
CLIENT: WDOH
TEST METHOD: ASTM D422

PARTICLE SIZE ANALYSES

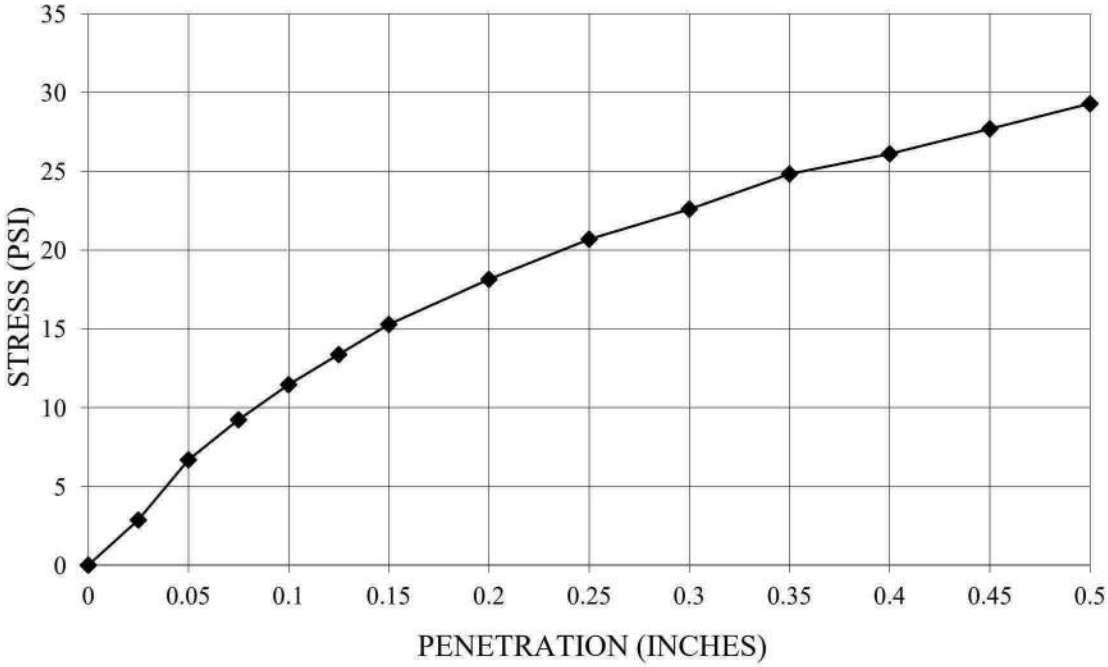
US_GRAIN_SIZE 18839-GX LANDER.GPJ US_LAB.GDT 1/5/17

INBERG-MILLER ENGINEERS

CALIFORNIA BEARING RATIO

INBERG-MILLER ENGINEERS
ASTM D1883

CLIENT:	State of Wyoming	SAMPLE NO.:	B-20
PROJECT:	Life Resource Center	TESTED BY:	JPM
JOB NO.:	RX18839	PROCTOR METHOD:	D698
TEST DATE:	1-9-17	SWELL (%):	1.9
DESCRIPTION:	Dark Brown Sandy Clay	SURCHARGE (LBS):	10
		DEPTH (FT):	0-5'



BEFORE SOAKING	
Moist. Content (%):	15.0
Dry Density (PCF):	109.3

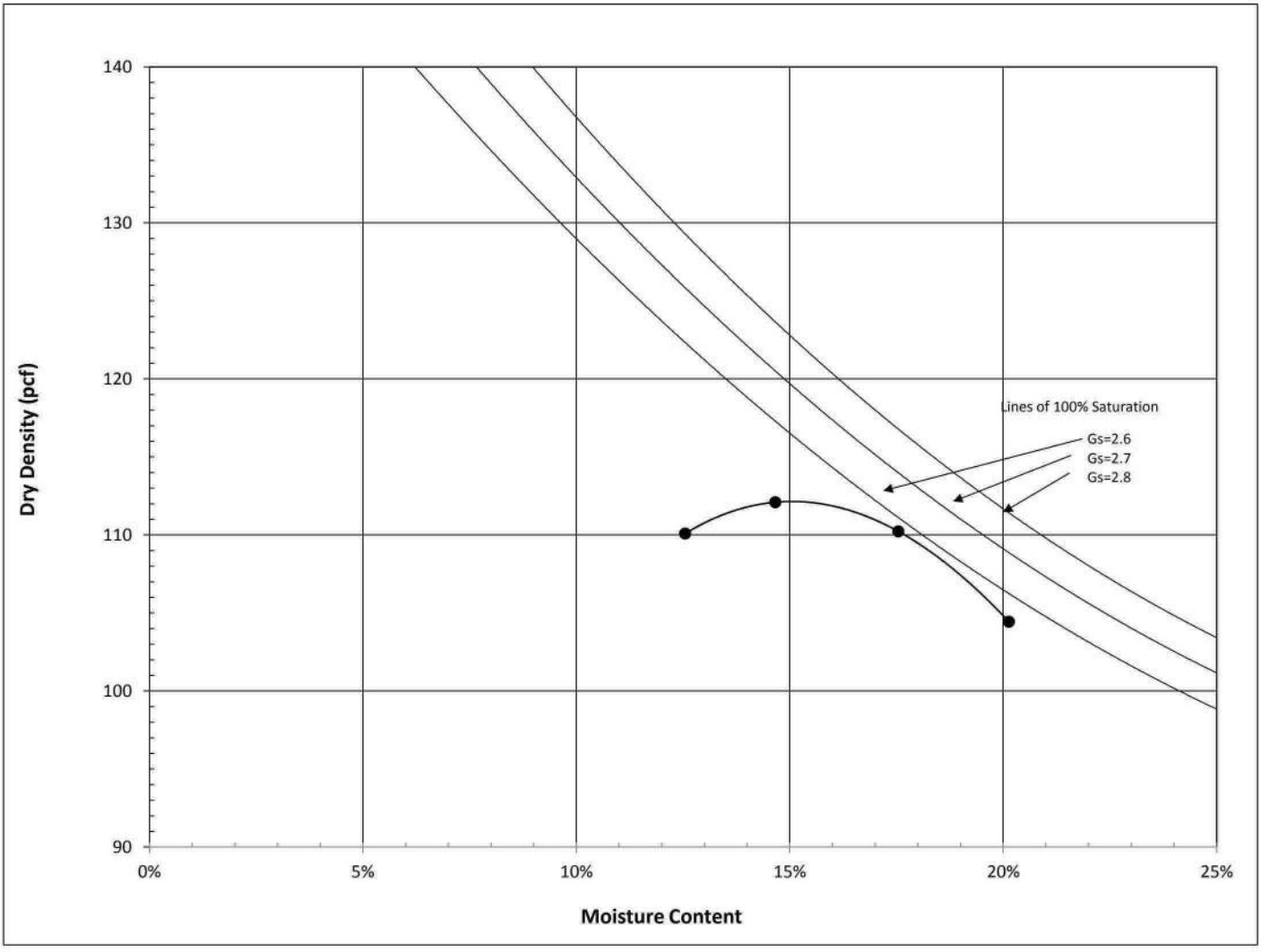
D698	
Opt. Moist. Content (%):	15
Max. Dry Density (PCF):	112

AFTER SOAKING	
Moist. Content (%):	19.8
Dry Density (PCF):	108.4

TEST RESULTS	
Compaction of Sample (%):	97.5
California Bearing Ratio:	1.1

Moisture-Density Analysis

Client:	Wy. State Construction Department	**IME Sample No:**	**B20**
Address:		**Sampled By:**	IME
		Sample Date:	12/21/2016
		Date Received in Lab:	12/21/2016
Attention:		**Type of Material:**	Soil
		Source:	Auger Cuttings
IME Project No:	18839RX	**Sample Description:**	Dark Brown Sandy Clay
Project Name:	Wyoming Life Resource Center		
Project Location:	Lander, Wy.	**ASTM Method:**	D698
		Tested By:	
Sample Location/ID:	0-10'	**Test Date:**	

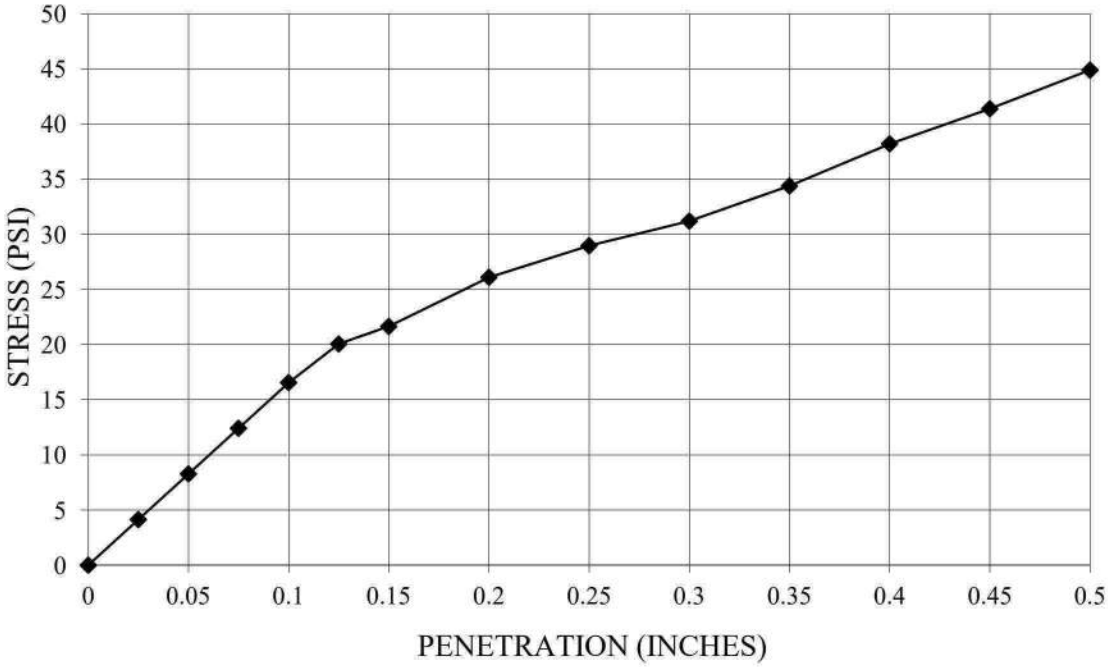


OPTIMUM MOISTURE CONTENT (%)	**15**
MAXIMUM DRY DENSITY (PCF)	**112**

CALIFORNIA BEARING RATIO

INBERG-MILLER ENGINEERS
ASTM D1883

CLIENT:	State of Wyoming	SAMPLE NO.:	B22
PROJECT:	Life Resource Center	TESTED BY:	JPM
JOB NO.:	RX18839	PROCTOR METHOD:	D698
TEST DATE:	1-9-17	SWELL (%):	0.1
DESCRIPTION:	Dark Brown Sandy Clay	SURCHARGE (LBS):	10
		DEPTH (FT):	0-5'



BEFORE SOAKING	
Moist. Content (%):	15.4
Dry Density (PCF):	102.0

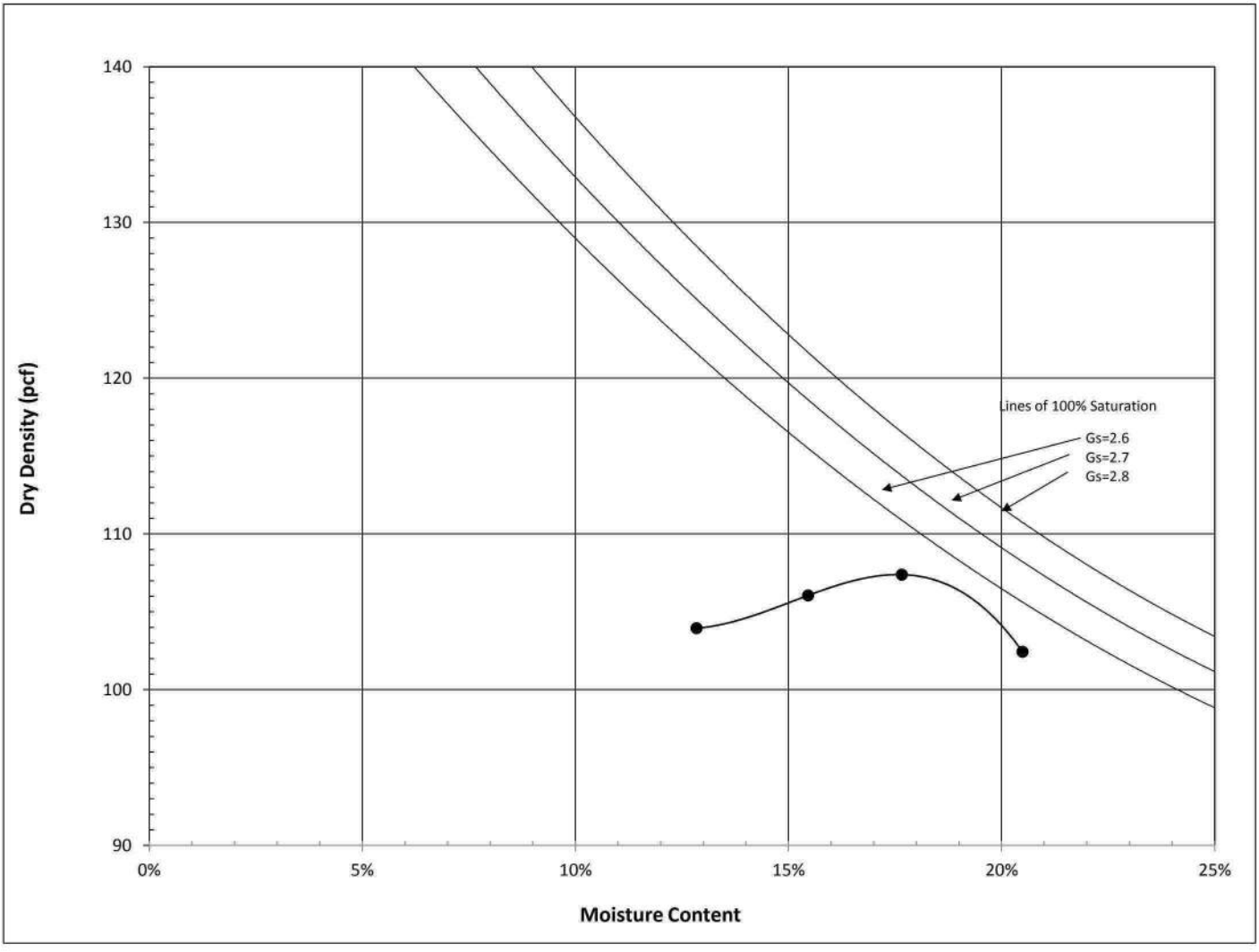
D698	
Opt. Moist. Content (%):	15.5
Max. Dry Density (PCF):	106.1

AFTER SOAKING	
Moist. Content (%):	22.7
Dry Density (PCF):	101.2

TEST RESULTS	
Compaction of Sample (%):	96.1
California Bearing Ratio:	1.7

Moisture-Density Analysis

Client:	Wy. State Construction Department	**IME Sample No:**	**B22**
Address:		**Sampled By:**	IME
		Sample Date:	12/21/2016
		Date Received in Lab:	12/21/2016
Attention:		**Type of Material:**	Soil
		Source:	Auger Cuttings
IME Project No:	18839RX	**Sample Description:**	Dark Brown Sandy Clay
Project Name:	Wyoming Life Resource Center		
Project Location:	Lander, Wy.	**ASTM Method:**	D698
		Tested By:	
Sample Location/ID:	0-5'	**Test Date:**	



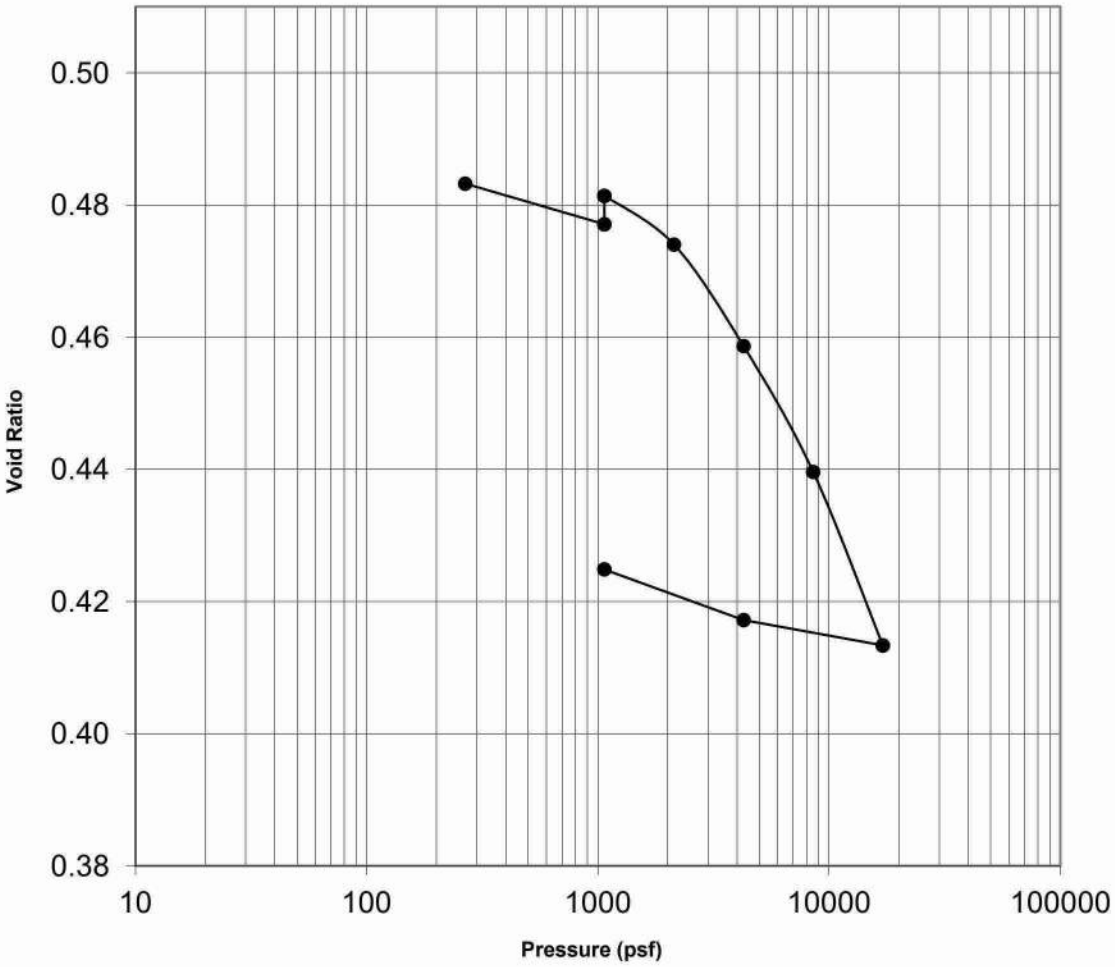
OPTIMUM MOISTURE CONTENT (%)	**15.5**
MAXIMUM DRY DENSITY (PCF)	**106.1**

CONSOLIDATION-SWELL TEST

INBERG-MILLER ENGINEERS

CLIENT: State of Wyoming
PROJECT: Wyoming Life Resource Center
JOB NO.: 18839RM
TEST METHOD: D2345

TEST DATE: 1/6/2016
TESTED BY: JPM
SAMPLE NO.: B11
DEPTH (ft): 10-11'



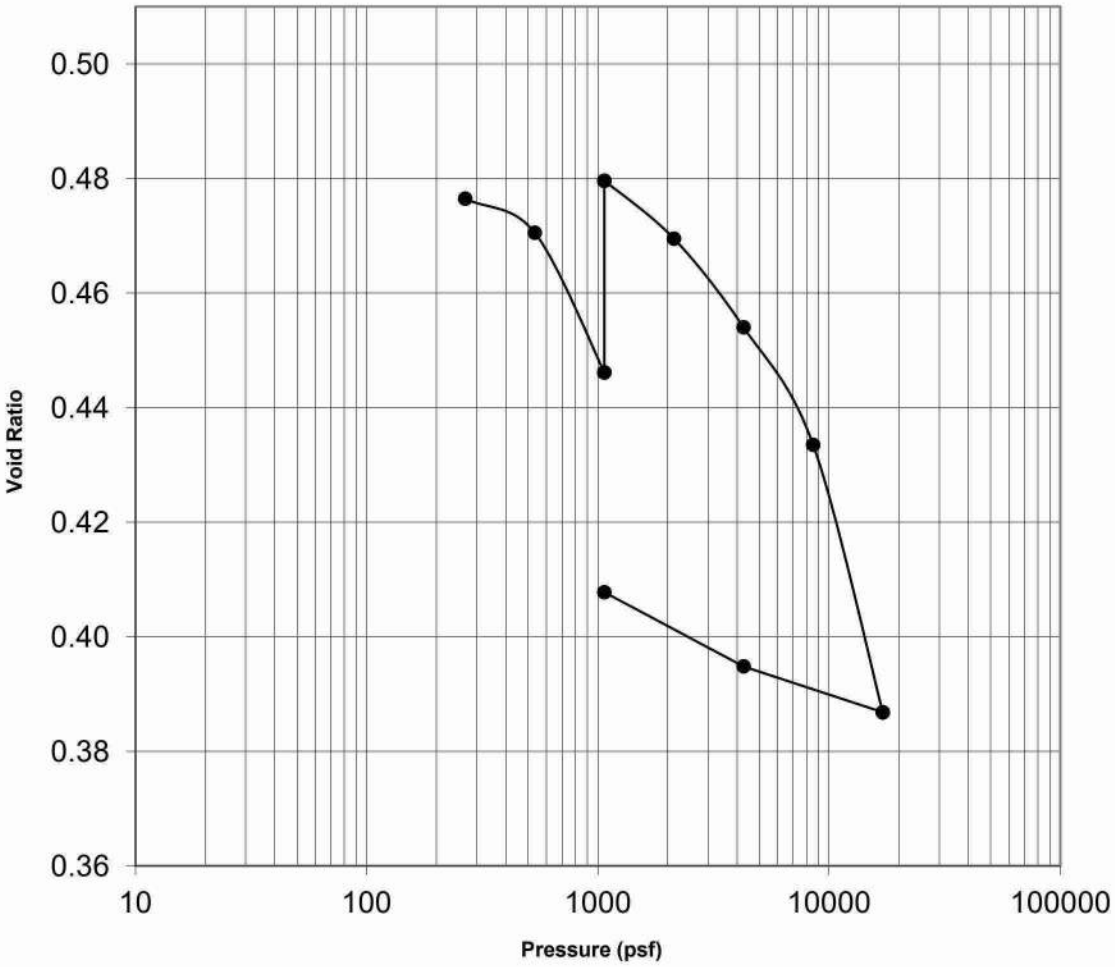
Swell Pressure(psf):	1599	Percent Swell:	0.3	
			Initial	Final
Overburden Pres.(psf):	400	Moisture Content(%):	18.2	18.2
Preconsol. Pres.(psf):	700	Dry Density(pcf):	110.3	109.7
Comp. Index(Cc):	0.087	Void Ratio:	0.536	0.413
Rebound Index(Cr):	0.010	Saturation(%):	91.8	100.0

Soil Description: Light Brown Silty Clay

CONSOLIDATION-SWELL TEST

INBERG-MILLER ENGINEERS

CLIENT:	State of Wyoming	TEST DATE:	12/22/2016
PROJECT:	Wyoming Life Resource Center	TESTED BY:	JPM
JOB NO.:	18839RM	SAMPLE NO.:	B17
TEST METHOD:	D2345	DEPTH (ft):	11-11.5'



Swell Pressure(psf):	5571	Percent Swell:	2.3

			Initial	Final
Overburden Pres.(psf):	400	Moisture Content(%):	15.1	16.8
Preconsol. Pres.(psf):	700	Dry Density(pcf):	114.5	113.3
Comp. Index(Cc):	0.155	Void Ratio:	0.487	0.387
Rebound Index(Cr):	0.017	Saturation(%):	83.8	100.0

Soil Description: Dark Brown Silty Clay

APPENDIX C

GLOSSARY

Definition of certain words, terms or phrases that are used in this report are provided below, to help the reader to interpret the intent of Inberg Miller Engineers. These definitions:

1. *May differ from other published versions*
2. *Have not been vetted by any organization outside of Inberg-Miller Engineers*
3. *May not present a complete understanding of the term*

The reader is encouraged to seek additional interpretation of important terms and consult with Inberg-Miller Engineers as necessary where discrepancies may be discovered, or a definition has not been provided.

Active Lateral Soil Pressure – Horizontal pressure applied by soil to a wall that sufficiently yields or rotates about its base to allow the full soil shear strength to be mobilized

Allowable End Bearing Pressure – Recommended maximum pressure on soil or rock expressed as load per unit area that can be applied across the full bottom bearing surface of a pier or pile deep foundation within a given settlement tolerance

Allowable Skin Friction – Recommended maximum frictional resistance of soil or rock as load per unit area that can be applied over the vertical side surface of a pier or pile deep foundation within a given settlement tolerance.

Alluvium – Soil that has been transported and deposited in a moving water environment

At-Rest Lateral Soil Pressure - Horizontal pressure applied by soil to a wall or the vertical face of a structure that is restrained from movement and soil is not allowed to deform

Backfill – Soil that is used to replace some or all of soil that was excavated, and is usually subject to material specifications and density requirements

Base – Either 1: the bottom surface of a structure or excavation, or 2: soil or aggregate that is placed immediately below a structure or pavement

Bearing Elevation – A subsurface level where the base of foundations rest and transmit applied load to the soil or rock

Bearing Stratum – A specific soil layer defined by soil description and depth below ground surface, or elevation, to which foundations transmit applied load

Claystone – Consolidated sedimentary bedrock comprised chiefly of clay sized particles

Collapse – Loss of inter-particle soil friction, usually as a result of the effects of excessive moisture or water, and often leading to large subsidence or settlement of supported structures

Colluvium – Soil that has accumulated as a result of gravitional transport, commonly found near the base of slopes

Compaction/Compacted – Process or the result of a process where soil density is increased, soil voids are decreased, and usually resulting in an increased strength and reduced settlement potential

Compressibility – Relative term applied to soil or soil layer to describe how much it may yield to expected applied load or pressure

Conglomerate – A mixture of clay through gravel-size particles, commonly cemented with calcium carbonate

Consistency – Term applied to cohesive soils to describe relative stiffness, often defined by either ASTM D1586 Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils or as indicated by unconfined compressive strength

Continuous Footing – A long narrow footing usually supporting a linear structure such as a wall. Length to width ratio may vary, but is commonly taken as 10.

Contraction Joints – Formed or sawn joints in concrete slabs or pavements used to control crack patterns that result from thermal contraction or shrinkage

Crushed Aggregate Base – Processed gravel at a specified grading and quantity of fractured faces, and sometimes certain durability requirements, that is used below slabs or pavements

Cut – Term applied to the volume or depth of soil that has been excavated to a certain design grade

Cut Slope – Soil or rock slope that results from cut or excavation

Density – The weight of soil for a unit volume, which may be stated in a dry condition, or a moist to saturated condition with weight of water included

Dewatering – Process of removing water from an excavation or lowering the groundwater elevation usually via drains or pumps

Differential Settlement – The difference in subsidence of a soil surface, or structure resting on soil, between two points spaced a certain distance apart

Disturbed Soil – Soil that has been loosened usually as a result of excavation activity, traffic, vibration

Embedment – The portion of a structure buried within a specific stratum, usually measured as a vertical distance

Engineered Fill – Soil that meets a specific gradation criteria and/or other quality requirements and that is placed at a specified thickness and moisture content and compacted to meet certain minimum density requirements, for the purpose of consistently obtaining certain minimum engineering properties for design

Envelope A – Specified gradation criteria that describes reasonably well graded sand and gravel mixtures, with less than 20 percent silt and clay.

ESAL – Criteria that describes traffic loading equivalent to a certain number of passes from an 18 kip single axle

Excavation Subgrade – The bottom of an excavation

Expansion Joints – Joints that are formed in a concrete pavement or slab that allow for thermal expansion of the concrete. Joints are usually filled with an elastic material to prevent entry of foreign particles

Factor of Safety – A multiplier for recommended allowable values that provides a margin for safety against failure, considering uncertainty and risk

Fill – Soil or rock that has been placed to raise the ground surface elevation

Footing/Foundation Subgrade – The surface of soil or rock to receive a structure which is usually a reinforced cast-in-place concrete

Friction Angle – A measure of physical resistance against sliding between soil or rock particles, usually ranging between 0 and 45 degrees

Frost Heave – A phenomenon that occurs in certain soil types where soil-moisture may concentrate and freeze as ice layers, causing upward swelling of the soil

Frost Protection – Any measure used to prevent frost-heave from affecting a structure

Frost Susceptibility – Soil types that are prone to frost heave

Geotechnical Engineer – An engineer trained through education and experience in soil mechanics and earth-structure systems

Grade Beam – A horizontal structural element that spans between foundations which may carry a portion of load from a structure above, but usually doesn't rely upon support from the soil below

Heave – The upward swelling of soil or rock, usually as a result of freezing or moisture adsorption

Helical Screw Pile/Pier – A foundation type that consists of a steel shaft with steel helices welded to the shaft, so that the system will pull itself into the ground when torque is applied

Hydraulic Conductivity – The rate at which water passes through soil under a certain pressure, usually expressed in the units of centimeters per second

Hydrostatic Pressure – The hydraulic pressure at a certain depth below the surface of a water body or water in saturated soil equivalent to the weight of water multiplied by the depth

Isolated Pad Footing – A single footing for the support of a leg, column, stanchion or other vertical structural element

Lifts – Layers of material that are placed as fill, backfill or pavement

Mat Foundation – A large, shallow spread footing that may support any combination of multiple point or area loads

Maximum Allowable Bearing Pressure – The recommended maximum pressure that may be applied to soil or rock, including a factor of safety, within estimated settlement tolerances

Maximum Dry Density – The peak soil density that is determined in a laboratory using a drop-hammer and mold over a range of varying moisture contents, expressed in terms of dry weight per unit volume

Moisture Sensitivity – A characteristic of soil that describes how the strength or compressibility is affected by increasing moisture content

Moisture Vapor Control – A design measure to limit the upward movement of soil moisture, usually through a concrete floor slab resting on the soil

Native Soil – Soil that is present naturally at a subject site

On-Site Fill – Soil used as fill or backfill that originates from a source located at the subject site

Optimum Moisture Content – The moisture content at which the maximum dry density is achieved in laboratory testing

Organic Materials – Matter contained in soil that is subject to decomposition

Overburden – Soil or rock that is present above an ore body, sedimentary bedrock or certain deposit such as gravel

Overexcavation – A process by which usually unsuitable or unwanted soil or rock is removed or excavated below the bottom of a structure or minimum required excavation limits

Passive Lateral Soil Pressure – Available resisting soil pressure when a structure is forced against the soil

Pavement Subbase – A specified soil type, often described by gradation that is placed below base, which in turn supports flexible or rigid pavement

Perched Groundwater – A subsurface condition where water collects above a relatively low permeability stratum

Permeability – The rate at which a liquid or gas may pass through soil, rock or other material

Pile/Pier Cap – A reinforced concrete block designed to distribute load from a structure to multiple deep foundation elements

Proof-Rolling – A process by which a subgrade is subjected to wheel loading to locate relative soft or yielding areas that might be repaired before covering with structures, soil, pavement etc.

Raft Foundation – See Mat Foundation

Residual Soil – Soil that has resulted from the in-place weathering of rock

Rigid Pavement – Usually reinforced or unreinforced Portland cement concrete, which when cured exhibits high compressive strength but is relatively inflexible

Sandstone - Sedimentary bedrock comprised chiefly of sand sized particles

Saturation – A condition where the pores of soil or rock are completely filled with water

Sedimentary Bedrock – Consolidated sediments of clay, silt or sand

Shrink-Swell Potential – Likelihood that soil or rock may increase or decrease in volume, usually as result of water adsorption and indicated by high plasticity index and/or measured response to inundation

Siltstone - Sedimentary bedrock comprised chiefly of silt sized particles

Site Fill – Soil used to raise the grade of all or a portion of a site to a design elevation, exclusive of structures or buildings

Slab Fill – Soil used to fill above the foundation bearing elevation to the bottom of any special subbase or base soil/aggregate that supports a concrete slab-on-grade

Slab Subbase – Soil that meets a specified gradation requirement or other criteria for placement below a base aggregate

Spread Footing/Foundations – A foundation type that usually consists of a reinforced, cast-in-place concrete that is formed in a round, square, rectangle or continuous strip shape for transferring structural loads to the soil and is placed at certain minimum depths for frost protection or confinement

Stripping Depth – The depth below ground surface that unsatisfactory soil or other materials should be removed before placement of engineered fill or structures

Structural Fill – Soil that meets a specified gradation or other quality or strength criteria for the purpose of raising the ground surface elevation or improving bearing conditions to receive a structure

Subgrade – Soil surface or substrate that will receive pavement, structure, engineered fill, backfill etc.

Synthetic Reinforcement – Specially manufactured fabric, usually as a woven or extruded plastic, used for the purpose of forming a composite with soil or aggregate and adding strength

Synthetic Separation - Specially manufactured fabric, usually as a woven plastic or non-woven fibrous plastic, used for the purpose creating a barrier for the migration of fine-grained soil

Topsoil – Soil that contains organic matter, usually as decayed vegetation and roots, in sufficient quantity that it is compressible, moisture sensitive, or subject to settlement with continued decay

Total Settlement – An estimate of the amount of settlement that may occur over the life of a structure as a result of compression of underlying soil due to the pressure imposed by the structure

Transient Loading – Short term loads applied to a structure, such as from seismic force or wind pressure.

Ultimate Bearing Capacity – An estimate of the bearing pressure applied to a soil stratum that would induce shear failure, without consideration of a factor of safety or limiting settlement

Undisturbed Soil – Soil that is allowed to remain in its natural state without changing moisture content or density

Void Form – A concrete form material for casting a structure which provides support long enough for the concrete to complete curing and gain sufficient strength for the structure to support itself, leaving a void when the form disintegrates with weathering and moisture.

Water Table – The surface of groundwater within saturated soil or rock layers

Weathered Bedrock – Native rock formation that has become delaminated or shows evidence of disintegration as determined and defined by the geotechnical engineer to distinguish a certain stratum for the purposes of the report

GENERAL NOTES - LOG OF TEST BORING/TEST PIT

DESCRIPTIVE SOIL CLASSIFICATION

Grain Size Terminology

Soil Fraction		Particle Size	U.S. Standard Sieve Size
Boulders		Larger than 12"	Larger than 12"
Cobbles		3" to 12"	3" to 12"
Gravel:	Coarse	3/4" to 3"	3/4" to 3"
	Fine	4.76mm to ¾"	#4 to ¾"
Sand:	Coarse	2.00mm to 4.76mm	#10 to #4
	Medium	0.42mm to 2.00mm	#40 to #10
	Fine	0.074mm to 0.42mm	#200 to #40
Silt		0.005mm to 0.074mm	Smaller than #200
Clay		Smaller than 0.005mm	Smaller than #200

Plasticity characteristics differentiate between silt and clay

Relative Density		Consistency	
Term	"N" Value*	Term	q_u-tons/sq. ft.
Very Loose	0-4	Very Soft	0.0 to 0.25
Loose	4-10	Soft	0.25 to 0.5
Medium Dense	10-30	Firm	0.5 to 1.0
Dense	30-50	Stiff	1.0 to 2.0
Very Dense	Over 50	Very Stiff	2.0 to 4.0
		Hard	Over 4.0

*Note: The penetration number, N, is the summation of blows required to effect two successive 6" penetrations of the 2" split-barrel sampler. The sampler is driven with a 140-pound weight falling 30", and is seated to a depth of 6" before commencing the standard penetration test.

DESCRIPTIVE ROCK CLASSIFICATION

Engineering Hardness Description of Rock

(not to be confused with MOH's scale for minerals)

Very Soft	Can be carved with a knife. Can be excavated readily with point of pick. Pieces one inch or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Medium Soft	Can be grooved or gouged 1/16-inch deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-inch-maximum size by hard blows of the point of a geologist's pick.
Medium Hard	Can be scratched with knife or pick. Gouges or grooves to ¼-inch deep. Can be excavated by hard blow of a geologist's pick. Hand specimens can be detached by moderate blow.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Very Hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.

NOMENCLATURE

Drilling and Sampling

SS	--	Split Barrel (spoon) Sampler
N	--	Standard Penetration Test Number, blows/foot*
ST	--	Thin-walled Tube (Shelby Tube) Sampler
DC	--	Thick-wall, ring lined, drive sampler
C	--	Coring
DP	--	Direct Push Sampler
CS	--	Continuous Sampler (used in conjunction with hollow stem auger drilling)
D	--	Disturbed Sample (auger cuttings, air/wash rotary cuttings, backhoe, shovel, etc.)

Laboratory Tests

USCS	--	Unified Soil Classification System (soil type)
W	--	Water Content (%)
LL	--	Liquid Limit (%)
PL	--	Plastic Limit (%)
PI	--	Plasticity Index (LL-PL) (%)
q_u	--	Unconfined Strength, TSF
q_p	--	Penetrometer Reading (estimate of unconfined strength), TSF
γ_m	--	Moist Unit Weight, PCF
γ_d	--	Dry Unit Weight, PCF
WSS	--	Water Soluble Sulfate (%)
Φ	--	Angle of Internal Friction (degrees)
c	--	Soil Cohesion, TSF
SG	--	Specific gravity of soil solids
S	--	Degree of Saturation (%)
e	--	Void Ratio
n	--	Porosity
k	--	Permeability (cm/sec)

Water Level Measurement

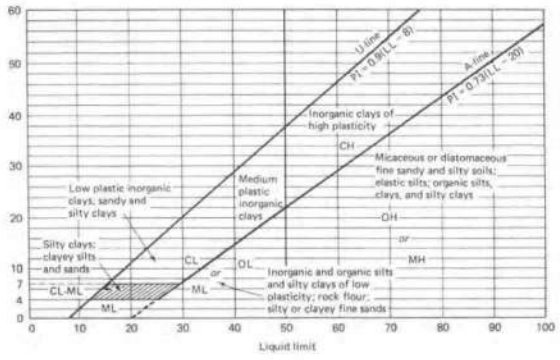
▼ -- Water Level at Time Shown

Note: Water level measurements shown on the boring logs represent conditions at the time indicated, and may not reflect static levels, especially in cohesive soils. The available water level information is given at the bottom of each log.

CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES

ASTM Designation: D2487-69 and D2488-69
(Unified Soil Classification System)

Major Divisions			Group Symbols		Typical Names	Laboratory Classification Criteria	
Coarse-Grained Soils (More than half of material is larger than No. 200 sieve size)	**Gravels** (More than half of coarse fraction is larger than No. 4 sieve size)	**Clean Gravels** (Little or no fines)	GW		Well graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 % GW,GP, SW, SP More than 12% GM, GC, SM, SC	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} x D_{60}}$ between 1 & 3
			GP		Poorly Graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW
		Gravels w/ Fines (Appreciable amount of fines)	GM[a]	d	Silty gravels, gravel-sand-silt mixtures		Atterberg limits below "A" line or P.I. less than 4 — Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
				u			Atterberg limits below "A" line or P.I. greater than 7 — Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			GC		Clayey gravels, gravel-sand-clay mixtures		
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	**Clean Sands** (Little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines		$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} x D_{60}}$ between 1 & 3
			SP		Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW
		Sands w/ Fines (Appreciable mount of fines)	SM[a]	d	Silty sands, sand-silt mixtures		Atterberg limits above "A" line or P.I. less than 4 — Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
				u			Atterberg limits above "A" line or P.I. greater than 7 — Limits plotting in hatched zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			SC		Clayey sands, sand-clay mixtures		
Fine-Grained Soils (More than half material is smaller than No. 200 sieve size)	**Silts and Clays** (Liquid limit less than 50)		ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	**Plasticity Chart**	
			CL		Inorganic clays of low to medium plasticity, gravelly, clays, sandy clays, silty clays, lean clays		
			OL		Organic silts and organic silty clays of low plasticity		
	Silts and Clays (Liquid limit greater than 50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH		Inorganic clays of high plasticity, fat clays		
			OH		Organic clays of medium to high plasticity, organic silts		
	Highly Organic Soils		P_t		Peat and other highly organic soils		



[a] Division of GM and SM groups into subdivision of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

[b] Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.

Important Information about Your

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you —* should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical-Engineering Report Is Based on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical-engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical-engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold-prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your GBA-Member Geotechncial Engineer for Additional Assistance

Membership in the GEOPROFESSIONAL BUSINESS ASSOCIATION exposes geotechnical engineers to a wide array of risk confrontaton techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your GBA-member geotechnical engineer for more information.

GBA GEOPROFESSIONAL BUSINESS ASSOCIATION

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IIGER 0914/5.0MRP

SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING REPORT



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SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 Section Includes

A. Concrete formwork.
B. Floors and slabs on grade.
C. Concrete foundation walls.
D. Concrete reinforcement.
E. Concrete curing.

1.02 Related Requirements

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
C. Section 32 13 13 – Concrete Paving: Installation and accessories for site paving.
D. Section 03 35 11 – Concrete Floor Finishes: Surface Treatments and Sealers.

1.03 Reference Standards

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
B. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
C. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.
D. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
E. ACI PRC-308 - Guide to External Curing of Concrete; 2016.
F. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
G. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
H. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2024.
J. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.
K. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.
L. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.

M. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
N. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
O. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2024a.
P. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.
Q. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2024.
R. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.
S. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2025.
T. ASTM C845/C845M - Standard Specification for Expansive Hydraulic Cement; 2024.
U. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.
V. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
W. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2025).
X. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2020.
Y. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.
Z. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).
AA. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 Submittals

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
C. Mix Design: Submit proposed concrete mix design.
    1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
    2. Indicate proposed mix design complies with requirements of ACI CODE-318, Chapter 5 - Concrete Quality, Mixing and Placing.
    3. Indicate proposed mix design complies with admixture manufacturer's written recommendations.

D. Samples: Submit samples of under slab vapor retarder to be used.
E. Test Reports: Submit report for each test or series of tests specified.
F. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 Quality Assurance

A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.

1.06 Warranty

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 Formwork

A. Formwork Design and Construction: Comply with guidelines of ACI PRC-347 to provide formwork that will produce concrete complying with tolerances of ACI SPEC-117.
B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
    1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
    2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
    3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches (38 mm) of concrete surface.

2.02 Reinforcement Materials

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
    1. Finish: Unfinished, unless otherwise indicated.
B. Reinforcement Accessories:
    1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch (1.29 mm).
    2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 Concrete Materials

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.

B. Blended, Expansive Hydraulic Cement: ASTM C845/C845M, Type K.
   1. Products:
      a. CTS Cement Manufacturing Corporation; Type K Cement: www.ctscement.com/#sle.
      b. Euclid Chemical Company; EUCON MSA: www.euclidchemical.com/#sle.
      c. Substitutions: See Section 016000 - Product Requirements.

C. Fine and Coarse Aggregates: ASTM C33/C33M.

D. Fly Ash: ASTM C618, Class C or F.

E. Calcined Pozzolan: ASTM C618, Class N.

F. Silica Fume: ASTM C1240, proportioned in accordance with ACI PRC-211.1.

G. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 Admixtures

A. Chemical Admixture:

B. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

C. Air Entrainment Admixture: ASTM C260/C260M.
   1. Manufacturers:
      a. Master Builders Solutions; MasterAir Series: www.master-builders-solutions.com/en-us/#sle.
      b. Substitutions: See Section 016000 - Product Requirements.

2.05 Accessory Materials

A. Under slab Vapor Retarder:
   1. Sheet Material: ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   3. Products:
      a. Henry, a Carlisle Company; Moistop Ultra 15
      b. ISI Building Products; Viper VaporCheck II 15-mil (Class A)
      c. Stego Industries, LLC

d. Tex-Trude, LP; Xtreme Vapor Barrier (15-mil)
e. W. R. Meadows, Inc; PERMINATOR Class A - 15 mils (0.38 mm)
f. Substitutions: See Section 01 60 00 - Product Requirements.

2.06 Curing Materials

A. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
1. Product dissipates within 4 to 6 weeks.
2. Products:
a. Dayton Superior Corporation
b. Euclid Chemical Company; COLOR-CRETE CURE AND SEAL VOC
c. Kaufman Products Inc; Thinfilm 420 Resin Base
d. Mapei Corporation; Mapecure DR
e. Nox-Crete Inc; Res-Cure DH 100
f. Sinak Corporation; Cure3D
g. SpecChem, LLC; SpecRez
h. US Spec, an Oldcastle APG brand; Maxcure Wax White
i. W. R. Meadows, Inc; 1100
j. Substitutions: See Section 01 60 00 - Product Requirements.

2.07 Concrete Mix Design

A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.
B. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.
C. Normal Weight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
5. Cement Content: See S0.0 for cement content requirements.
6. Water-Cement Ratio: Maximum __ percent by weight.
7. Total Air Content: per S0.0, determined in accordance with ASTM C173/C173M.
8. Maximum Slump: 4 inches (100 mm).

9. Maximum Aggregate Size: 3/4 inch (19 mm).

2.08 Mixing

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
B. Transit Mixers: Comply with ASTM C94/C94M.
C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 Examination

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 Preparation

A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.
B. Verify that forms are clean and free of rust before applying release agent.
C. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R – 2013.
D. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
E. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches (150 mm). Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
    1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.

3.03 Installing Reinforcement and Other Embedded Items

A. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
B. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 Placing Concrete

A. Place concrete in accordance with ACI PRC-304.
B. Place concrete for floor slabs in accordance with ACI PRC-302.1.
C. Notify Architect not less than 24 hours prior to commencement of placement operations.
D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
G. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 Slab Jointing

A. Locate joints as indicated on drawings.
B. Anchor joint fillers and devices to prevent movement during concrete placement.
C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch (5 mm) thick blade and cut at least 1 inch (25 mm) deep but not less than one quarter (1/4) the depth of the slab.
E. Contraction Joint Devices: Use preformed joint device, with top set flush with top of slab.

3.06 Floor Flatness and Levelness Tolerances

A. Maximum Variation of Surface Flatness:
    1. Exposed Concrete Floors: 1/4 inch (6 mm) in 10 feet (3 m).
B. Correct the slab surface if tolerances are less than specified.
C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 Concrete Finishing

A. Repair surface defects, including tie holes, immediately after removing formwork.
B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch (6 mm) or more in height.
C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch (6 mm) or more in height. Provide finish as follows:

1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.

D. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
   1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI PRC-302.1; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
   2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   3. Other Surfaces to Be Left Exposed: Trowel as described in ACI PRC-302.1, minimizing burnish marks and other appearance defects.

3.08 Curing and Protection

A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than seven days.
C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
D. Surfaces Not in Contact with Forms:
   1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
   2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
   3. Final Curing: Begin after initial curing but before surface is dry.

3.09 Field Quality Control

A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements.
B. Provide free access to concrete operations at project site and cooperate with appointed firm.
C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards (76 cu m) or less of each class of concrete placed.
F. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.10 Defective Concrete

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 Protection

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION 03 30 00

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03 35 11 – CONCRETE FLOOR FINISHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Liquid densifiers and hardeners.

B. Clear coatings.

1.02 RELATED REQUIREMENTS

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

B. Section 03 30 00 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with concrete floor placement and concrete floor curing.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.

C. Manufacturer's Instructions: Indicate manufacturer's installation instructions for preparation of substrate, application of finishing products, and requirements for polishing and protection of finished surface.

D. Installer's qualification statement.

E. Maintenance Data: Provide data on maintenance and renewal of applied finishes.

F. Specimen warranty.

G. Executed warranty.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of type specified and with at least 3 years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's sealed packaging, including application instructions.

1.07 FIELD CONDITIONS

A. Maintain light level equivalent to a minimum 200 W light source at 8 feet (2.5 m) above the floor surface over each 20 foot (6 m) square area of floor being finished.

B. Do not finish floors until interior heating system is operational.

C. Maintain ambient temperature of 50 degrees F (10 degrees C) minimum.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide two-year manufacturer warranty commencing on the Date of Substantial Completion.

C. Installer Warranty: Provide two-year manufacturer warranty commencing on the Date of Substantial Completion.

PART 2 PRODUCTS

2.01 Applications

A. Unless otherwise indicated on drawings, finish concrete floors using low-gloss clear coating.

B. Densifier and Hardener:

1. Use at the following locations: New Concrete.

2.02 DENSIFIERS AND HARDENERS

A. Liquid Densifier and Hardener: Penetrating chemical compound that reacts with concrete, filling the pores, hardening, and dustproofing.

1. Composition: Lithium silicate.
2. Products:
   a. Adhesives Technology Corporation; CONVERGENT Pentra-Pel (SI)
   b. Clemons Concrete Coatings
   c. Dayton Superior Corporation
   d. Euclid Chemical Company; ULTRASIL LI+
   e. Kaufman Products Inc; SureHard LS
   f. Master Builders Solutions
   g. Sinak Corporation; LithoHard
   h. SpecChem, LLC; LithSeal SC
   i. W. R. Meadows, Inc; Liqui-Hard Ultra.
   j. Substitutions: See Section 016000 - Product Requirements.

2.03 COATINGS

A. Clear Coatings: Clear coating recommended by manufacturer for finishing concrete floors and slabs.

1. Gloss: Matte.
2. Type: Membrane-forming, lithium water-based, clear liquid coating for application to newly placed concrete.

a. Products:
    1) Adhesives Technology Corporation; CONVERGENT Pentra-Finish (HG).
    2) Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that floor surfaces are acceptable to receive the work of this section.

B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

3.02 GENERAL

A. Apply materials in accordance with manufacturer's instructions.

3.03 COATING APPLICATION

A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.

B. Verify that water vapor emission from concrete and relative humidity in concrete are within limits established by coating manufacturer.

C. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.

D. Apply coatings in accordance with manufacturer's instructions, matching approved mock-ups for color, special effects, sealing and workmanship.

3.04 PROTECTION

A. Protect installed coatings from subsequent construction operations.

B. Do not permit traffic over unprotected floor surface.

END OF SECTION 03 35 11

SECTION 04 01 00 – MAINTENANCE OF MASONRY

PART 1 GENERAL

1.01 Section Includes

A. Water, Steam, and Chemical cleaning of masonry surfaces.

B. Repointing mortar joints.

C. Repair of damaged masonry.

D. Retrofitting masonry veneer construction with brick ties and weeps.

1.02 Related Requirements

A. Section 042613 - Masonry Veneer.

B. Section 044313 - Stone Masonry Veneer.

1.03 Reference Standards

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 Administrative Requirements

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1. Require attendance of parties directly affecting work of this section.
2. Review conditions of installation, installation procedures, and coordination with related work.

B. Scheduling:

1. Perform cleaning and washing of masonry between the hours of 7 am to 11 pm only.
2. Perform blast cleaning of masonry between the hours of 7 am to 11 pm only.

1.05 Submittals

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on cleaning compounds.

C. Test Reports: Provide testing information on combination of carbon fiber reinforcement and epoxy when used together as a system.

D. Manufacturer's Instructions: For cleaning materials, indicate special procedures, conditions requiring special attention.

1.06 Quality Assurance - Masonry Work

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

1. Maintain one copy of each document on project site.

B. Restorer: Company specializing in masonry restoration with minimum three years of documented experience.

1.07 Mock-Ups

A. See Section 014000 - Quality Requirements for additional requirements.

B. Clean a 10 ft (3 m) by 10 ft (3 m) panel of wall to determine extent of cleaning.

1. Repeat, using different cleaning methods for until acceptable.

C. Locate where directed.

D. Acceptable panel and procedures employed will become the standard for work of this section.

E. Mock-up may remain as part of the Work.

1.08 Delivery, Storage, and Handling

A. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.

1.09 Field Conditions - Masonry Work

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

B. Do not blast clean or use process creating dust, dirt, when wind is over 10 mph (16 kph).

1.10 Warranty

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Warranty: Provide 5-year warranty for CFRP system design, installation, bond to the substrate, and interlaminar bond, as well as mechanical property retention and fabric-resin compatibility, commencing on Date of Substantial Completion. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 Manufacturers

A. Restoration and Cleaning Chemicals:

1. Diedrich Technologies, Inc
2. HMK Stone Care System
3. PROSOCO
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 Cleaning Materials

A. Cleaning Agent: Detergent and Acid solution type.

B. Acid Solution: Clean, stain free, commercial hydrochloric (muriatic) acid, mixed one part to 10 parts of potable water.

2.03 Retrofit Accessories

A. Manufacturers:

1. Masonry Technology, Inc; Retrofit Weep
2. Substitutions: See Section 016000 - Product Requirements.

B. Description:

1. Retrofit Weeps: Polyethylene, 3/8 inch (9.5 mm) diameter by depth of brick, anchored in drilled hole in mortar joint with two-part epoxy bonding agent.

2.04 Mortar Materials

A. Comply with requirements of Section 04 20 00.

2.05 Masonry Materials

A. Section 042613 - Masonry Veneer.

B. Section 044313 - Stone Masonry Veneer.

PART 3 EXECUTION

3.01 Examination

A. Verify that surfaces to be cleaned are ready for work of this section.

3.02 Preparation

A. Protect surrounding elements from damage due to restoration procedures.

B. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.

C. Separate areas to be protected from restoration areas using means adequate to prevent damage.

D. Cover existing landscaping with tarpaulins or similar covers.

E. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.

F. Close off adjacent occupied areas with dust proof and weatherproof partitions.

G. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.

H. Do not allow cleaning runoff to drain into sanitary or storm sewers.

3.03 Preparation - Retrofit Accessories

A. Demolition and Removal:

1. See Section 02 41 00 - Demolition for additional requirements.

3.04 Installation - Retrofit Accessories

A. Install in accordance with manufacturer's written instructions.

3.05 Cleaning Existing Masonry

A. Cleaning Detergent: Brush clean masonry surfaces at indicated locations with cleaning agent in accordance with the manufacturer's instructions. Saturate masonry with clean water and flush loose mortar and dirt.

B. High Pressure Cold Water: Cold water blast pressure to brick masonry surfaces, at all locations, providing uniform finish.

3.06 Cleaning New Masonry

A. Verify mortar is fully set and cured.

B. Clean surfaces and remove large particles with wood scrapers, brass or nylon wire brushes.

C. Scrub walls with cleaning agent solution using stiff brush. Thoroughly rinse and wash off cleaning solution, dirt and mortar crumbs using clean, pressurized water.

D. Protect area below cleaning operation and keep masonry soaked with water and flushed free of acid and dissolved mortar continuously for duration of cleaning.

E. Before solution dries, rinse and remove acid solution and dissolved mortar, using clean, pressurized water.

3.07 Restoration Cleaning

A. Clean surfaces and remove large particles with wood scrapers or non-ferrous wire brush.

B. Brush coat masonry with restoration cleaner, mixed into solution in accordance with manufacturer's instructions.

C. Provide a second application if required to match mock-up area.

D. Allow sufficient time for solution to remain on masonry and agitate with soft fiber brush or sponge.

E. Rinse from the bottom up with potable water applied at 400 psi (2 750 kPa) and at a rate of 4 gal/min (16 L/min).

3.08 Cleaning

A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.

B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.

C. Clean surrounding surfaces.

END OF SECTION 04 01 00

SECTION 04 05 11 – MASONRY MORTARTING AND GROUTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mortar for masonry.
B. Grout for masonry.

1.02 RELATED REQUIREMENTS

A. Section 042000 - Unit Masonry: Installation of mortar and grout.
B. Section 042613 - Masonry Veneer: Installation of mortar.
C. Section 044313 - Stone Masonry Veneer: Installation of mortar.

1.03 REFERENCE STANDARDS

A. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.
B. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2025.
C. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025a.
D. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
E. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2025a.
F. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2024.
G. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength; 2022.
H. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2024.
I. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2020.
J. ASTM E518/E518M - Standard Test Methods for Flexural Bond Strength of Masonry; 2022.
K. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Reports: Submit reports on mortar indicating compliance of mortar to property requirements of ASTM C270 and test and evaluation reports per ASTM C780.
C. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.07 FIELD CONDITIONS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

A. Use only factory premixed packaged dry materials for mortar and grout, with addition of water only at project site.

B. Mortar Color: Natural gray unless otherwise indicated.

C. Mortar Mix Designs: ASTM C270, Property Specification.

1. Exterior Masonry Veneer: Type N.

2.02 MATERIALS

A. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.

1. Type: Fine.
2. Manufacturers:
    a. Amerimix, an Oldcastle APG brand; AMX 600 CG Coarse Fill Grout
    b. Substitutions: See Section 016000 - Product Requirements.

B. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.

1. Color(s): As selected by Architect from manufacturer's full range.
2. Manufacturers:
    a. Davis Colors
    b. Lambert Corporation
    c. Solomon Colors; Solomon Colors Concentrated A, H, and X Series
    d. Substitutions: See Section 016000 - Product Requirements.

C. Water: Clean and potable.

D. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

E. Bonding Agent: Latex type.

F. Integral Water Repellent Admixture: Polymeric liquid admixture added to mortar at the time of manufacture.

1. Performance of Mortar with Integral Water Repellent:
   a. Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours:
      1) No water visible on back of wall above flashing at the end of 24 hours.
      2) No flow of water from flashing equal to or greater than 0.032 gallons per hour (0.05 L per hour) at the end of 24 hours.
      3) No more than 25 percent of wall area above flashing visibly damp at end of test.
   b. Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.
   c. Compressive Strength: ASTM C1314; maximum 5 percent decrease.
2. Use only in combination with masonry units produced with integral water repellent admixture.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio; mix in accordance with manufacturer's instructions, uniform in coloration.

D. Add admixtures in accordance with manufacturer's instructions; mix uniformly.

E. Do not use anti-freeze compounds to lower the freezing point of mortar.

F. If water is lost by evaporation, re-temper only within two hours of mixing.

2.04 GROUT MIXING

A. Mix grout in accordance with ASTM C94/C94M.

B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.

C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.

D. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

3.01 PREPARATION

A. Apply bonding agent to existing concrete surfaces.

B. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

A. Install mortar and grout to requirements of section(s) in which masonry is specified.

3.03 GROUTING

A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of Contract Documents.

B. Low-Lift Grouting:

1. Limit height of pours to 12 inches (300 mm).
2. Limit height of masonry to 16 inches (400 mm) above each pour.
3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.

C. High-Lift Grouting:

1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
2. Place grout for spanning elements in single, continuous pour.

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field tests, in accordance with provisions of Section 014000 - Quality Requirements.

B. Test and evaluate mortar in accordance with ASTM C780 procedures.

1. Test with same frequency as specified for masonry units.

C. Prism Tests: Test masonry and mortar panels for compressive strength in accordance with ASTM C1314, and for flexural bond strength in accordance with ASTM C1072 or ASTM E518/E518M; perform tests and evaluate results as specified in individual masonry sections.

3.05 SCHEDULES

A. Exterior Cavity Wall: Type S mortar with Type N pointing mortar.

END OF SECTION 04 05 11

SECTION 04 26 13 – MASONRY VENEER

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Clay facing brick.
B. Mortar and grout.
C. Reinforcement and anchorage.
D. Flashings.
E. Installation of lintels.
F. Accessories.

1.2 RELATED REQUIREMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. Section 04 01 00 – Maintenance of Masonry: Cleaning and repair of masonry veneer.
C. Section 01 43 13 – Stone Masonry Veneer: Anchored cut stone veneer.
D. Section 05 40 00 - Cold-Formed Metal Framing: Steel stud backup for masonry veneer.
E. Section 06 10 00 - Rough Carpentry: Wood stud backup for masonry veneer.
F. Section 07 92 00 - Joint Sealants: Sealing control and expansion joints.

1.3 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2024.
C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019 (Reapproved 2025).
D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip, Plate, and Flat Bar; 2024.
E. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
G. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2022.
H. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar.

C. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

F. See Section 01 60 00 - Product Requirements, for additional provisions.

1.5 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.6 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet (2.4 m) long by 6 feet (1.8 m) high; include mortar and accessories and structural backup in mock-up.

B. Mock-up may remain as part of the Work.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

1.8 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 - PRODUCTS

2.1 BRICK UNITS

A. Manufacturers:
1. Endicott Clay Products Co; Face Brick
2. Interstate Brick
3. General Shale Brick
4. Meridian Brick LLC
5. Metro Brick

6. Substitutions: See Section 016000 - Product Requirements.

B. Facing Brick: ASTM C216, Type FBX, Grade SW.
1. Color and texture to match Existing and as indicated on drawings.
2. Size: 3-5/8” x 2-2/3 x 7-5/8”
3. Absorption: initial rate no more than 45g per 30 sq inches, nor less than 5 grams per 30 sq inches

2.2 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M Type N, interior use only.

B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

C. Aggregate for Mortar: ASTM C144, except for joints less than 1/4 inch – use aggregate graded with 100 percent passing No. 16 sieve.

D. Preblended Mortar Mixes: Weigh dry mortar mix materials, including cementitious material, lime, aggregate, and admixtures in a factory under controlled conditions. Factory dry and preblended mortar ingredients.

E. Color Admixture: High-purity, chemically inert, unfading and alkali-fast mineral oxides, finely ground and specifically prepared for use in cement and lime mortars.

F. Hydrated Lime: ASTM C207, Type S.

G. Grout Aggregate: ASTM C404.

H. Water: Clean and potable.

2.3 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa) yield strength, deformed billet bars; galvanized.

B. Joint Reinforcement Type: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

C. Joint Reinforcement Standard: ASTM A951/A951M.
1. Type: Truss or ladder.
2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
3. Size: 0.1483-inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.
4. Manufacturers:
   a. 3GEN Masonry Products
   b. Blok-Lok Limited
   c. Hohmann & Barnard, Inc; HB 213 Veneer Anchor
   d. WIRE-BOND; Reinforcement and Anchorage:
   e. Substitutions: See Section 016000 - Product Requirements.

D. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
   3. Vertical adjustment: Not less than 3-1/2 inches (89 mm).
   4. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less than one continuous horizontal joint reinforcement wire of 0.1483 inch (3.8 mm) diameter.
   5. Manufacturers:
      a. 3GEN Masonry Products; H-13
      b. Hohmann & Barnard, Inc
      c. TruFast Walls, a division of Altenloh, Brinck & Co. US, Inc; Thermal-Grip MVA
      d. WIRE-BOND
      e. Substitutions: See Section 016000 - Product Requirements.

E. Strap Anchors: Bent steel shapes, 1-1/2-inch (38 mm) width, 0.105-inch (2.7 mm) thickness, 24-inch (610 mm) length; with 1-1/2 inches (38 mm) long, 90-degree bend at each end to form U or Z shape or with cross pins; hot-dip galvanized in accordance with ASTM A153/A153M Class B.
   1. Manufacturers:
      a. 3GEN Masonry Products; Barrel Anchor Metal: www.3genmp.com.

F. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.

2.4 FLASHINGS

A. Metal Flashing Materials:
   1. Copper Flashing: ASTM B370, 060 soft annealed; 20 oz/sq ft (0.7 mm) thick; natural finish.
   2. Stainless Steel Flashing: ASTM A666/A666M, Type 304, soft temper; 26-gauge, 0.0187 inch (0.48 mm) thick; finish 2B to 2D.
   3. Prefabricated Metal Flashing: Smooth fabricated 12 oz/sq ft (3.66 kg/sq m) copper flashing for surface mounted conditions.
      a. Manufacturers:
         1) Cheney Flashing Company
         2) Hohmann & Barnard, Inc
         3) WIRE-BOND
         4) Substitutions: See Section 016000 - Product Requirements.

B. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane, or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.

2.5 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      a. Blok-Lok Limited.
      b. Hohmann & Barnard, Inc
      c. WIRE-BOND
      d. Substitutions: See Section 016000 - Product Requirements.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self-expanding; in maximum lengths available.
   1. Manufacturers:
      a. Hohmann & Barnard, Inc.
      b. WIRE-BOND
      c. Substitutions: See Section 016000 - Product Requirements.

C. Weeps:
   1. Type: Preformed aluminum vents with sloping louvers.
   2. Color(s): As selected by Architect from manufacturer's full range.
   3. Manufacturers:
      a. Advanced Building Products, Inc
      b. Blok-Lok Limited
      c. CavClear, a Division of Archovations Inc
      d. Hohmann & Barnard, Inc
      e. Mortar Net Solutions; WeepVent
      f. WIRE-BOND
      g. Substitutions: See Section 016000 - Product Requirements.

D. Drainage Fabric: Polyester mesh bonded to a water and vapor-permeable fabric.
   1. Manufacturers:
      a. Advanced Building Products, Inc; Mortairvent
      b. Mortar Net Solutions; DriPlane
      c. York Flashings; Weep Armor Weep Vent Protection
      d. Substitutions: See Section 016000 - Product Requirements.

E. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Mortar Diverter: Panels installed at flashing locations.
      a. Manufacturers:
         1) 3GEN Masonry Products; Wall Defender
         2) Advanced Building Products, Inc
         3) CavClear, a Division of Archovations Inc;
         4) Substitutions: See Section 016000 - Product Requirements.

F. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.6 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, Proportion Specification.
   1. Masonry below grade and in contact with earth; Type S.
   2. Exterior, non-loadbearing masonry; Type N.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Grout: ASTM C476; consistency as required to fill volumes completely for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).

D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.2 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Brick Units:
1. Bond: Running Bond.
2. Coursing: Three units and three mortar joints to equal 8 inches (200 mm).
3. Mortar Joints: Concave.

3.3 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Interlock intersections and external corners, except for units laid in stack bond.

D. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

E. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

F. Isolate top joint of masonry veneer from horizontal structural framing members or support angles with compressible joint filler.

3.4 WEEPS/CAVITY VENTS

A. Install weeps in veneer walls at 24 inches (600 mm) on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

B. Install cavity vents in veneer walls at 32 inches (800 mm) on center horizontally below shelf angles and lintels and at top of walls.

3.5 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions.

D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.6 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Install horizontal joint reinforcement 16 inches (400 mm) on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches (400 mm) on center vertically and 36 inches (900 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.

E. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches (400 mm) on center vertically and 24 inches (600 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.

F. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

G. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches (400 mm) on center.

3.7 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches (152 mm), minimum, into adjacent masonry or turn up at least 1 inch (25.4 mm), minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Terminate flashing up 8 inches (203 mm) minimum on vertical surface of backing:
   1. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer’s directions.

C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.

D. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.

E. Support flexible flashings across gaps and openings.

F. Lap end joints of flashings at least 6 inches (152 mm), minimum, and seal watertight with flashing sealant/adhesive.

3.8 LINTELS

A. Install loose steel lintels over openings.

B. Refer to Section 05 50 00 – Metal Fabrications and Structural Drawings.

3.9 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

3.10 TOLERANCES

A. Install masonry within the site tolerances found in TMS 402/602.

B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft (6 mm in 3 m) and 1/2 inch in 20 ft (13 mm in 6 m) or more.

D. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm in 1 m) and 1/4 inch in 10 ft (6 mm in 3 m); 1/2 inch in 30 ft (13 mm in 9 m).

F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).

3.11 CUTTING AND FITTING

A. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 CLEANING

A. Remove excess mortar and mortar smears as work progresses.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.13 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION 04 26 13

SECTION 04 43 13 – STONE MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Anchored cut stone veneer at exterior walls.
B. Metal anchors and accessories for anchored veneer.
C. Accessories for adhered veneer.
D. Setting mortar.

1.02 RELATED REQUIREMENTS

A. Section 040511 - Masonry Mortaring and Grouting: Setting and pointing mortar.
B. Section 042613 – Masonry Veneer: Joint reinforcement, Ties, Anchors, and Through-wall flashing.
C. Section 072500 - Weather Barriers: Water-resistive barrier over sheathing.
D. Section 076200 - Sheet Metal Flashing and Trim: Flashings.
E. Section 079200 - Joint Sealants: Sealing joints indicated to be left open for sealant.

1.03 REFERENCE STANDARDS

A. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2023.
B. ASTM C119 - Standard Terminology Relating to Dimension Stone; 2022.
C. ASTM C568/C568M - Standard Specification for Limestone Dimension Stone; 2022.
D. ASTM C1515 - Standard Guide for Cleaning of Exterior Dimension Stone, Vertical And Horizontal Surfaces, New or Existing; 2020.
E. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.
F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
G. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on stone units, mortar, and reinforcement.
C. Samples: Submit two stone samples illustrating color range, texture, and markings.
D. Samples: Submit mortar color samples.
E. Stone Fabricator's Qualification Statement.
F. Installer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Stone Fabricator Qualifications: Company specializing in fabricating cut stone with minimum ten years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type required by this section, with minimum five years of documented experience.

1.06 MOCK-UP

A. Construct stone wall mock-up; include stone anchor accessories, corner condition, and typical control joint in mock-up.

B. See Section 01 40 00 - Quality Requirements for additional requirements.

C. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect stone from discoloration during storage on site.

B. Provide ventilation to prevent condensation from forming on stone.

1.08 FIELD CONDITIONS

A. Cold Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 STONE

A. Stone, General: See recommendations in ASTM C1528/C1528M.

B. Oolitic Limestone: Variety to match existing; complying with ASTM C568/C568M Classification II - Medium Density.

1. Grade: ILI Standard.
2. Color: Match existing.
3. Grain Direction: Vertical.
4. Surface Finish: Smooth; as described in ASTM C119 and ASTM C1528/C1528M.
5. Acceptable Producers:
    a. Alabama Stone Co; Veneer.
    b. Continental Cut Stone, Inc.
    c. Indiana Limestone Company.
    d. Mezger Enterprises Ltd.
    e. Polycor Natural Stone.
    f. Substitutions: See Section 016000 - Product Requirements.

2.02 MORTAR APPLICATIONS

A. Use only factory premixed packaged dry materials for mortar, with addition of water only at project site.

B. Mortar Color: Natural gray unless otherwise indicated.

C. Dash Bond Coat: One part Portland cement, with maximum two parts sand.

D. Scratch Coat Mortars: Scratch coat mortars for application directly to metal lath.

1. Prepackaged/Preblended: ASTM C1714/C1714M, Type N or Type S.

E. Setting Bed Mortars: Setting bed used to adhere stone veneer units to scratch coat mortar or to bondable concrete or concrete masonry.

1. Prepackaged/Preblended Latex Modified: ANSI A118.4 or ANSI A118.15.

F. Pointing Mortars: Pointing or grouting mortars used to fill the joints between individual stone veneer units once the setting bed mortar has sufficiently cured.

1. Prepackaged/Preblended Latex Modified: ANSI A118.4 or ANSI A118.15.
2. Color: Mineral oxide pigment; color as selected.

2.03 MORTAR MIXES

A. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.

1. Application(s): Use this type of bond coat where indicated.
2. Manufacturers:
   a. ARDEX Engineered Cements; ARDEX X 5.
   b. Custom Building Products.
   c. LATICRETE International, Inc; LATICRETE MVIS Veneer Mortar.
   d. Substitutions: See Section 016000 - Product Requirements.

2.04 ACCESSORIES - ANCHORED VENEER

A. Horizontal Joint Reinforcement: See Section 042613.

B. Flashings: See Section 042000.

C. Weep/Cavity Vents: Molded PVC grille, insect resistant.

1. Products:
   a. Masonry Technology, Inc; Stone Cavity Weep: www.mtidry.com/#sle.
   b. Substitutions: See Section 016000 - Product Requirements.

D. Back Coating:

1. Bituminous.
2. Cementitious parging of mortar.

E. Cleaning Solution: Type that will not harm stone, joint materials, or adjacent surfaces.

2.05 STONE FABRICATION - ANCHORED VENEER

A. Nominal Size: As indicated on drawings to match existing.

B. Fabricate for 3/8-inch (10 mm) beds and joints.

C. Bed and Joint Surfaces:

1. Cut or sawn full square for full thickness of unit.

D. Form stone corners to irregular joint profile. Clean jagged corners from stone in preparation for setting.

E. Slope exposed top surfaces of stone and horizontal sill surfaces for shedding water.

F. Cut drip slot in bottom surface of work projecting more than 1/2 inch (13 mm) over window frame. Size slot not less than 3/8 inch (10 mm) wide and 1/4 inch (6 mm) deep for full width of projection.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that support work and site conditions are ready to receive work of this section.

1. Per ASTM C1242, exterior walls to receive thin natural stone veneers should be designed with a stiffness ratio of L/1000 minimum.

B. Verify that substrates to receive mortar scratch coat or setting bed comply with stone veneer manufacturer's instructions.

1. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

C. Verify that items built-in under other sections are properly located and sized.

3.02 PREPARATION - ANCHORED VENEER

A. Establish lines, levels, and coursing. Protect from disturbance.

B. Clean stone prior to installation. Do not use wire brushes or implements that mark or damage exposed surfaces.

C. Clean sawn surfaces of rust stains and iron particles.

D. Coat back surfaces not to be in contact with setting mortar with back coating material. Allow coating to cure.

3.03 INSTALLATION - ANCHORED VENEER

A. Install flashings of longest practical length and seal watertight to back-up. Lap end joints minimum 6 inches (150 mm) and seal watertight.

B. Cut stone at site to produce clean faces.

C. Size stone units to fit opening dimensions and perimeter conditions.

D. Wet absorptive stone in preparation for placement to minimize moisture suction from mortar.

E. Arrange stone pattern to provide color uniformity and minimize visual variations , and provide a uniform blend of stone unit sizes.

F. Provide setting and pointing mortar in accordance with Section 040511.

G. Arrange stone coursing in running bond with consistent joint width.

H. Set stone in full mortar setting bed to fully support stone over bearing surface. Use setting buttons or shims to maintain correct joint width.

I. Install weep/cavity vents in vertical stone joints at 6 inches on center horizontally; immediately above horizontal flashings, above shelf angles and supports, and at top of each cavity space; do not permit mortar accumulation in cavity space.

3.04 INSTALLATION - WATER-RESISTIVE BARRIER

A. Where required by thin stone veneer fabricator's instructions or by local codes, install two layers of water-resistive barrier in accordance with water-resistive barrier manufacturer's instructions. Integrate water-resistive barrier with all flashing accessories, adjacent water-resistive barriers, doors, windows, penetrations, and cladding transitions.

B. Apply water-resistive barrier horizontally with upper layer lapped over lower layer minimum 2 inches (51 mm).

C. Lap water-resistive barrier minimum 6 inches (152 mm) at vertical joints.

D. Lap water-resistive barrier minimum 16 inches (406 mm) past the corner in both directions at inside and outside corners.

E. In two layer applications, start with two horizontal layers at bottom of exterior wall or structure.

3.05 INSTALLATION - MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

B. Extend metal flashings through exterior face of stone and terminate in an angled drip with hemmed edge.

C. Lap end joints of flashings at least 6 inches (152 mm), minimum, and seal watertight with flashing sealant/adhesive.

3.06 CONTROL AND EXPANSION JOINTS

A. Form joints as detailed on drawings.

B. Discontinue lath, scratch coat, and setting bed at movement joints in adhered veneer.

3.07 TOLERANCES

A. Install masonry within the site tolerances found in TMS 402/602.

B. Maximum Variation from Unit to Adjacent Unit: 1/16 inch (1.6 mm).

C. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet (6 mm in 3 m) and 1/2 inch in 20 feet (13 mm in 6 m) or more.

D. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

E. Maximum Variation from Level Coursing: 1/8 inch in 3 feet (3 mm in 1 m) and 1/4 inch in 10 feet (6 mm in 3 m); 1/2 inch in 30 feet (13 mm in 9 m).

F. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet (3 mm in 1 m).

3.08 CLEANING

A. Remove excess mortar as work progresses, and upon completion of work.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Clean exterior stone per ASTM C1515.

E. Use non-metallic tools in cleaning operations.

3.09 PROTECTION

A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

END OF SECTION

SECTION 05 40 00 - COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud exterior wall framing.
B. Formed steel joist and purlin framing and bridging.

1.02 RELATED REQUIREMENTS

A. Section 05 44 00 - Cold-Formed Metal Trusses.
B. Section 07 92 00 - Joint Sealants.
C. Section 09 22 16 - Non-Structural Metal Framing.

1.03 DEFINITIONS

A. General: See AISI S240 for definitions of terms used in this section.
B. Connection: A combination of structural elements and joints used to transmit forces between two or more members.
C. Connector: A device used to transmit forces between cold-formed steel structural members or between a cold-formed steel structural member and another structural element.

1.04 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
B. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.
C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
F. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
G. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
H. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).
I. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).

J. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
K. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
L. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by affected installers.

1.06 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on cold-formed steel structural members; include material descriptions and base steel thickness.
C. Product Data: Provide manufacturer's data on factory-made connectors and mechanical fasteners, showing compliance with requirements.
D. Steel Framing Industry Association (SFIA) Certification:
    1. Submit documentation that metal studs and connectors used on project meet or exceed requirements of International Building Code.
E. Design Data: As Indicated on Drawings.
F. Evaluation Service Reports: Provide reports indicating compliance with specified requirements for cold-formed steel structural members.
G. Manufacturer's Installation Instructions: Provide installation instructions for connectors.
H. Manufacturer's Qualification statement.

1.07 QUALITY ASSURANCE

A. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Structural Framing:
    1. CEMCO
    2. ClarkDietrich
    3. Jaimes Industries

4. MarinoWARE
5. SCAFCO Corporation
6. Steel Construction Systems
7. Telling Industries
8. The Steel Network, Inc

B. Connectors:
1. Same manufacturer as metal framing.
2. Simpson Strong-Tie.
3. Substitutions: See Section 016000 - Product Requirements.

2.02 Performance Requirements

A. Design Requirements: Design cold-formed framing systems, components and connectors to withstand specified design loads in compliance with ICC (IBC), ASCE 7, AISI S100, and AISI S240.
B. Design Criteria: In accordance with applicable codes.
1. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
2. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

2.03 MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.

2.04 STRUCTURAL FRAMING COMPONENTS

A. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.
1. Thickness and Depth: As indicated on drawings.
B. Jamb Studs: AISI S240; manufactured, engineered, c-shaped with wide flanges, designed to replace conventional double-stud framing at openings.
1. Thickness and Depth: As indicated on drawings.

C. Rafters / Purlins: AISI S240; c-shaped studs and matching nominal width and compatible height.
   1. Thickness and Depth: As indicated on drawings

2.05 CONNECTIONS

A. Performance Requirements: Provide connections in compliance with requirements of AISI S240.
B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.
C. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
D. Fixed Connections: Provide nonmovement devices for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.
   1. Products:
      a. ClarkDietrich
      b. Simpson Strong-Tie.
      c. Substitutions: See Section 016000 - Product Requirements.
E. Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connectors where indicated on the drawings.
F. Products:
   1. ClarkDietrich; Spazzer 5400 Bridging Bar: www.clarkdietrich.com/#sle.
   2. ClarkDietrich; FastBridge Clip: www.clarkdietrich.com/#sle.
   3. Simpson Strong-Tie; SUBH Bridging Connector: www.strongtie.com/#sle.
   4. Substitutions: See Section 016000 - Product Requirements.

2.06 Miscellaneous Connections

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized per ASTM A153/A153M.
   1. Products:
      a. ITW Commercial Construction North America; ITW CCNA-Buildex Teks Select Series
      b. Substitutions: See Section 016000 - Product Requirements.
B. Anchorage Devices: Powder actuated.
C. Welding: Comply with AWS D1.1/D1.1M.

2.07 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
B. Galvanizing Repair: Touch up bare steel with zinc-rich paint in compliance with ASTM A780/A780M.
C. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 PREPARATION

A. Structural Wall Foundations: For gaps between wall bottom track and top of foundation 1/4 inch (6.4 mm) or greater, level substrate with loadbearing shims or grout between track and foundation.

3.03 Installation - General

A. Install structural members and connections in compliance with ASTM C1007.

3.04 INSTALLATION OF STUDS

A. Install wall studs plumb and level.
B. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
C. Install load-bearing studs full length in one piece. Splicing of studs is not permitted.
D. Install load-bearing studs; brace, and reinforce to develop full strength and achieve design requirements.
E. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
F. Install intermediate studs above and below openings to align with wall stud spacing.
G. Provide deflection allowance in stud track, directly below horizontal building framing at non-loadbearing framing.
H. Attach cross studs to studs for attachment of fixtures anchored to walls.

I. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

J. Touch-up field welds and damaged corrosion-protected surfaces zinc-rich paint in compliance with ASTM A780/A780M.

3.05 INSTALLATION OF JOISTS and PURLINS

A. Install framing components in accordance with manufacturer's instructions.

B. Make provisions for erection stresses. Provide temporary alignment and bracing.

C. Place joists at 24 inches (600 mm) on center; not more than 2 inches (50 mm) from abutting walls, and connect joists to supports using fastener method.

D. Locate joist end bearing directly over load-bearing studs or provide load distribution on top of stud track.

E. Provide web stiffeners at reaction points.

F. Touch-up field welds and damaged primed surfaces with primer.

3.06 INSTALLATION OF WALL SHEATHING

A. Install wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.

3.07 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Provide inspections for welding, mechanical fastening, and cold-formed steel light-frame construction in accordance with requirements of AISI S240.

3.08 TOLERANCES

A. Studs - Vertical Alignment (Plumbness): 1/960 of span or 1/8 inch in 10 ft (3.2 mm in 3000 mm), in accordance with ASTM C1007.

B. Studs - Maximum Variation from True Position:1/8 inch in accordance with ASTM C1007.

C. Stud Spacing: 1/8 inch (3.2 mm) from the designated spacing, provided that the cumulative error does not exceed the requirements of the finishing materials in accordance with ASTM C1007.

END OF SECTION 05 40 00

SECTION 05 44 00 – COLD FORMED METAL TRUSSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Light gauge cold-formed steel roof trusses.
B. Anchorages, bracing, and bridging.

1.02 RELATED REQUIREMENTS

A. Section 05 40 00 - Cold-Formed Metal Framing: Light gauge structural metal studs, joists, and rafters.

1.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
C. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
D. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.
E. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
F. CFSEI 5000 - Field Installation Guide for Cold-Formed Steel Roof Trusses; May 2000.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
    1. Span charts.
    2. Storage and handling requirements and recommendations.
    3. Installation methods.
C. Shop Drawings:
    1. Include detailed roof truss layout.
    2. Show member type, location, spacing, size and gauge, methods of attachment, and erection details. Indicate supplemental bracing, strapping, splices, bridging, and accessories.

3. Include truss design drawings, signed and sealed by a qualified professional engineer registered in the State in which the Project is located, verifying ability of each truss design to meet applicable code and design requirements.
    a. Include the following:
        1) Design criteria.
        2) Engineering analysis depicting member stresses and deflections.
        3) Member sizes and gauges.
        4) Bracing requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver trusses and other materials in manufacturer's unopened bundles or containers, each marked with manufacturer's name, brand, type, and grade. Exercise care to avoid damage during unloading, storing, and erection.
B. Store trusses on blocking, pallets, platforms, or other supports, off the ground and in an upright position, sufficiently braced to avoid damage from excessive bending. Gently slope stored trusses to avoid accumulation of water on interior of truss chord members.
C. Protect trusses and accessories from contact with earth, corrosion, deformation, mechanical damage, or other deterioration when stored at project site.

PART 2 PRODUCTS

2.01 TRUSS DESIGN REQUIREMENTS

A. Design: Calculate structural characteristics of cold-formed steel truss members according to AISI S100.
B. Structural Performance: Design, engineer, fabricate, and erect trusses to withstand specified design loads for project conditions within required limits.
    1. Design Loads: In accordance with applicable codes.
        a. Roof Live Loads:
            1) See Structural Drawings
    2. Deflections: Live load deflection meeting the following, unless otherwise indicated:
        a. Roofs: Maximum vertical deflection under live load of 1/240 of span.
    3. Design trusses to accommodate movement attributable to temperature changes within a range of 120 degrees F (67 degrees C) without damage or overstressing, sheathing failure, undue strain on fasteners and anchors, or other deleterious effects.

2.02 COMPONENTS

A. Trusses: Light gauge steel assemblies providing a complete horizontal framing system for locations indicated, ready for deck installation.
   1. Truss Type, Span, and Height: As indicated on drawings.
   2. Chord and Web Members: Fabricate required shapes from commercial quality galvanized steel sheet complying with ASTM A653/A653M, with minimum yield strength of 40,000 psi (275 MPa); minimum G60/Z180 coating; gauges as required for load conditions; all edges rolled or closed.

B. Fasteners: Self-drilling, self-tapping screw fasteners with corrosion-resistant plated finish, as recommended by steel truss manufacturer and marked for easy identification.
   1. Welding: Comply with applicable provisions of AWS D1.1/D1.1M and AWS D1.3/D1.3M.

C. Bracing, Bridging, and Blocking Members: Fabricate required shapes from commercial quality galvanized steel sheet complying with ASTM A653/A653M, with minimum yield strength of 33,000 psi (230 MPa); minimum G60/Z180 coating; gauges as required for load conditions.

2.03 FABRICATION

A. Factory fabricate cold-formed steel trusses plumb, square, true to line, and with secure connections, complying with manufacturer’s recommendations and project requirements.
   1. Fabricate trusses using jig templates.
   2. Cut truss members by sawing, shearing, or plasma cutting.
   3. Fasten members in full compliance with instructions of manufacturer. Wire tying of framing members is not permitted.

B. Tolerances: Fabricate trusses to maximum allowable tolerance variation from plumb, level and true line of 1/8 inch in 10 feet (1:1000).
   1. Up to 30 feet (9 m) Long: Maximum plus or minus 1/2 inch (12 mm) from design length.
   2. Over 30 feet (9 m) Long: Maximum plus or minus 3/4 inch (19 mm) from design length.
   3. Up to 5 feet (1.5 m) High: Maximum plus or minus 1/4 inch (6 mm) from design height.
   4. Over 5 feet (1.5 m) High: Maximum plus or minus 1/2 inch (12 mm) from design height.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install cold-formed steel trusses in strict accordance with manufacturer's instructions and approved shop drawings, using approved fastening methods.

B. Install temporary erection bracing and permanent bracing and bridging before application of any loads. Erect trusses with plane of truss webs vertical and parallel to each other, accurately located at spacing indicated. Anchor trusses securely at bearing points.
C. Adequately distribute applied loads to avoid exceeding the carrying capacity of any one joint, truss, or other component.
D. Exercise care to avoid damaging truss members during lifting and erection and to minimize horizontal bending of trusses.
E. Removal, cutting, or alteration of any truss chord, web, or bracing member in the field is prohibited, unless approved in advance by Architect or the engineer of record and the truss manufacturer.
F. Repair or replace damaged members and complete trusses as directed and approved in writing by Architect or the engineer of record and the truss manufacturer.
G. Galvanizing Repair: Touch up bare steel with zinc-rich paint in compliance with ASTM A780/A780M.
H. Roof Trusses:
    1. Comply with recommendations of CFSEI 5000.
    2. Align truss bottom chords with load-bearing studs or continuously reinforce track as required to transfer loads to structure.
    3. Install continuous bridging and permanent truss bracing as indicated.
    4. Install roof cross bracing and diagonal bracing as indicated.

3.02 TOLERANCES

A. Install trusses to maximum allowable tolerance variation from plumb, level, and true to line of 1/8 inch in 10 feet (1:1000).
B. Space individual trusses not more than plus or minus 1/8 inch (3.2 mm) from plan location. Cumulative error in placement may not exceed minimum fastening requirements of sheathing or other material fastened to trusses.

3.03 PROTECTION

A. Protect trusses from damage by subsequent construction activities.
B. Repair or replace damaged trusses, truss members, and bracing members; obtain approval in advance by Architect or the engineer of record and the truss manufacturer for all cutting, repairs, and replacements.

END OF SECTION 05 44 00

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
B. Section 042613 – Masonry Veneer: Placement of metal fabrications in masonry.
C. Section 099113 - Exterior Painting: Paint finish.
D. Section 099123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2025.
B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.
F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
H. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing; 2021.
I. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
J. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
K. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025.
L. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).

M. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025.
N. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
O. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019, with Editorial Revision (2025).
P. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
Q. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
R. SSPC-SP 2 - Hand Tool Cleaning; 2024.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
D. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Design under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.
C. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.
B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
C. Plates: ASTM A283/A283M.
D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
E. Stainless Steel, General: ASTM A666/A666M, Type 304.
F. Stainless Steel Tubing: ASTM A554, Type 304, 16 gauge, 0.0625 inch (1.59 mm) minimum metal thickness, 1-1/2 inch (38 mm) diameter.

G. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.
H. Slotted Channel Fittings: ASTM A1011/A1011M.
I. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
J. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
K. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
L. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
M. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
N. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.
B. Fabricate items with joints tightly fitted and secured.
C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
D. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS

A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
B. Lintels: As detailed; prime paint finish.
C. Door Frames for Overhead Door Openings, Wall Openings, and where indicated: Channel sections; prime paint finish.

2.04 FINISHES - STEEL

A. Prime paint steel items.
    1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
B. Prepare surfaces to be primed in accordance with SSPC-SP2.
C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
D. Prime Painting: One coat.

E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating. (Provide minimum 530 g/sq m galvanized coating.)
F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.05 FABRICATION TOLERANCES

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.
B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).
C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).
D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).
E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.
B. Furnish setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Perform field welding in accordance with AWS D1.1/D1.1M.
D. Obtain approval prior to site cutting or making adjustments not scheduled.
E. After erection, prime welds, abrasions, and surfaces not shop primed , except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION 05 50 00

SECTION 06 10 00 – ROUGH CARPENTRY

PART 1 GENERAL

1.01 Section Includes

A. Sheathing.
B. Roofing nailers.
C. Preservative treated wood materials.
D. Fire retardant treated wood materials.
E. Concealed wood blocking, nailers, and supports.
F. Miscellaneous wood nailers, furring, and grounds.

1.02 Related Requirements

A. Section 072500 - Weather Barriers: Water-resistive barrier over sheathing.
B. Section 072600 - Vapor Retarders: Vapor retarder over sheathing.
C. Section 072700 - Air Barriers: Air barrier over sheathing.
D. Section 076200 - Sheet Metal Flashing and Trim: Sill flashings.
E. Section 092116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 Reference Standards

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
B. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel; 2021.
C. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2024).
D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
E. AWPA U1 - Use Category System: User Specification for Treated Wood; 2025.
F. ITS (DIR) - Directory of Listed Products; Current Edition.
G. PS 20 - American Softwood Lumber Standard; 2025.
H. UL (DIR) - Online Certifications Directory; Current Edition.
I. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 Submittals

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on insulated sheathing and application instructions.
C. Product Data: Submit technical data on wood treatment.

1.05 Delivery, Storage, and Handling

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.06 Warranty

A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Manufacturer Warranty: Provide 2-year manufacturer warranty for materials and workmanship commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 General Requirements

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
    1. Species: Douglas Fir-Larch, unless otherwise indicated.
    2. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
    3. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 Dimension Lumber For Concealed Applications

A. Sizes: Nominal sizes as indicated on drawings, S4S.
B. Moisture Content: S-dry or MC19.
C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
    1. Lumber: S4S, No. 2 or Standard Grade.
    2. Boards: Standard or No. 3.

2.03 Construction Panels

A. Roof Sheathing: Wood structural panels with noncombustible overlayment or coating factory-bonded to interior face of plywood panels.
   1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84 or UL 723.
   2. Plywood Panels:
      a. Performance Category and Span Rating: 15/32 PERF CAT and 32/16 span rating.
      b. Bond Classification: Exposure 1.
      c. Grade: Structural 1 C-D.
      d. Sizes: 48 by 96 inches (1220 by 2440 mm).
      e. Edges: Square.

2.04 Accessories

A. Metal and Finish of Fasteners:
   1. Fire-Retardant-Treated Wood:
      a. Comply with manufacturer's recomendations.
      b. Nails, timber rivets, wood screws, and lag screws: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
      c. Staples: Type 304 stainless steel.
      d. Fasteners other than staples, nails, timber rivets, wood screws, and lag screws: Mechanically deposited zinc-coated steel, ASTM B695 Class 55 or better.
   2. Untreated Wood: Unfinished steel.

B. Sill Flashing: See Section 076200.
C. Water-Resistive Barrier: See Section 072500.
D. Vapor Retarder: See Section 072600.
E. Air Barrier: See Section 072700.

PART 3 EXECUTION

3.01 Preparation

A. Coordinate installation of rough carpentry members specified in other sections.

3.02 Installation - General

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.03 Installation of Construction Panels

A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
   1. Nail panels to framing; staples are not permitted.

3.04 Tolerances

A. Framing Members: 1/4 inch (6 mm) from true position, maximum.
B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

3.05 Field Quality Control

A. See Section 014000 - Quality Requirements for additional requirements.

3.06 Cleaning

A. Waste Disposal: See Section 017419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.
C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06 10 00 BLANK

SECTION 06 16 00 - SHEATHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Sheathing joint and penetration treatment.

B. Related Requirements:
1. Section 04 26 13 "Masonry Veneer" for brick veneer set as anchored veneer.
2. Section 06 10 53 "Miscellaneous Rough Carpentry" for plywood backing panels.
3. Section 07 27 26 "Fluid-Applied Membrane Air Barriers" for water-resistive barrier applied over wall sheathing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: From air-barrier and water-resistant glass-mat gypsum sheathing manufacturer, certifying compatibility of sheathing accessory materials with Project materials that connect to or that come in contact with the sheathing.

B. Product Test Reports: For each air-barrier and water-resistant glass-mat gypsum sheathing assembly, indicating compliance with specified requirements, for tests performed by a qualified testing agency.

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

1. Wood-preservative-treated plywood.
2. Fire-retardant-treated plywood.

D. Field quality-control reports.

1.5 DELIVERY, STORAGE, AND HANDLING

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

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Ratings: As tested according to ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 WALL SHEATHING

A. Glass-Mat Gypsum Sheathing: ASTM C 1177/1177M.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Georgia-Pacific Building Products; Dens-Glass Gold. or a comparable product by one of the following:

a. CertainTeed Corporation.
b. National Gypsum Company.
c. Temple-Inland Building Products by Georgia-Pacific.
d. United States Gypsum Company.

2. Type and Thickness: Regular, 5/8 inch thick or as indicated on drawings.
3. Size: 48 by 96 inches for vertical installation.

2.3 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with APA AFG-01 ASTM D3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof parapet and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

B. Screws for Fastening Wood Structural Panels to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

C. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached.

1. For steel framing less than 0.0329 inch thick, use screws that comply with ASTM C 1002.
2. For steel framing from 0.033 to 0.112 inch thick, use screws that comply with ASTM C 954.

2.5 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

A. Sealant for Glass-Mat Gypsum Sheathing: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing and recommended by tape and sheathing manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Sheathing Tape: Self-adhering glass-fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads/inch, of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing and with a history of successful in-service use.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
3. ICC-ES evaluation report for fastener.

D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to cold-formed metal framing with screws.
2. Install panels with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
3. Install panels with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Vertical Installation: Install vertical edges centered over studs. Abut ends and edges with those of adjacent panels. Attach at perimeter and within field of panel to each stud.

1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of panels.
2. For sheathing under stucco cladding, panels may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

D. Seal sheathing joints according to sheathing manufacturer's written instructions.

1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION 06 16 00

SECTION 07 13 26 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Modified bituminous sheet waterproofing.
2. Protection board.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, expansion joints, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

1. Include setting drawings showing layout, sizes, sections, profiles, and joint details of pedestal-supported concrete pavers.

C. Samples: For each exposed product and for each color and texture specified, including the following products:

1. 8-by-8-inch (200-by-200-mm) square of waterproofing and flashing sheet.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Research Reports: For modified bituminous sheet waterproofing/termite barrier, showing compliance with ICC AC380.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to set quality standards for installation.

1. Build for each typical waterproofing installation including accessories to demonstrate surface preparation, crack and joint treatments, inside and outside corner treatments, and protection.

a. Size: 100 sq. ft. (9.3 sq. m) in area.
b. Description: Each type of wall installation.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 FIELD CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.

1. Do not apply waterproofing in snow, rain, fog, or mist.

B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.7 WARRANTY

A. Manufacturer's Warranty:

1. Waterproofing Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

a. Warranty Period: Five years from date of Substantial Completion.

B. Installer's Special Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of two years.

1. Warranty includes removing and reinstalling protection board, drainage panels, insulation, pedestals, and pavers on plaza decks.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Waterproofing System: Obtain waterproofing materials, protection course, from single source from single manufacturer.

2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING

A. Modified Bituminous Sheet Waterproofing: Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated on one side to a 4-mil- (0.10-mm-) thick, polyethylene-film reinforcement, and with release liner on adhesive side.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Carlisle Coatings & Waterproofing Inc ; CCW MiraDRI 860/861. or a comparable product by one of the following:

a. CETCO, a Minerals Technologies company.
b. GCP Applied Technologies Inc.
c. Henry Company.
d. MAPEI Corporation.
e. Mar-flex Waterproofing & Building Products.
f. Polyguard Products, Inc.
g. Protecto Wrap Company.
h. Soprema, Inc.
i. Tamko Building Products, Inc.
j. W.R. Meadows, Inc.
k. York Manufacturing, Inc.

2. Physical Properties:

a. Tensile Strength, Membrane: 250 psi (1.7 MPa) minimum; ASTM D412, Die C, modified.
b. Ultimate Elongation: 300 percent minimum; ASTM D412, Die C, modified.
c. Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C); ASTM D1970/D1970M.
d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch (3-mm) movement; ASTM C836/C836M.
e. Puncture Resistance: 40 lbf (180 N) minimum; ASTM E154/E154M.
f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D570.
g. Water Vapor Permeance: 0.05 perm (2.9 ng/Pa x s x sq. m) maximum; ASTM E96/E96M, Water Method.
h. Hydrostatic-Head Resistance: 200 feet (60 m) Insert dimension minimum; ASTM D5385.

3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.3 AUXILIARY MATERIALS

A. Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.

1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.

B. Primer: Liquid solvent-borne primer recommended for substrate by sheet waterproofing material manufacturer.

C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet waterproofing material manufacturer.

D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.

E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.

F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm), predrilled at 9-inch (229-mm) centers.

G. Protection Course: ASTM D6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:

1. Thickness: Nominal 1/8 inch (3 mm) for vertical applications; 1/4 inch (6 mm) elsewhere.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of waterproofing.

1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D4263.
3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

D. Remove fins, ridges, mortar, and other projections.

E. Fill form tie holes, honeycomb, aggregate pockets, holes, and other voids.

F. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D4258.

1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch (1.6 mm).

G. Corners: Prepare, prime, and treat inside and outside corners in accordance with manufacturer's instructions.

1. Install membrane strips centered over vertical inside corners. Install 3/4-inch (19-mm) fillets of liquid membrane on horizontal inside corners and as follows:

a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
b. At plaza-deck-to-wall intersections, extend liquid membrane or sheet strips onto deck waterproofing and to finished height of sheet flashing.

H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions.

3.3 INSTALLATION OF MODIFIED BITUMINOUS SHEET WATERPROOFING

A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.

D. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

E. Seal edges of sheet waterproofing terminations with mastic.

F. Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing.

G. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fish mouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.

H. Immediately install protection course with butted joints over waterproofing membrane.

3.4 INSTALLATION OF MODIFIED BITUMINOUS SHEET WATERPROOFING/TERMITE BARRIER

A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions.

B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.

C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and 6-inch- (150-mm-) minimum end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.

D. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.

E. Seal edges of sheet waterproofing terminations with termination bar and sealant.

F. Install sheet waterproofing and auxiliary materials to tie into adjacent waterproofing.

G. Roll waterproofing membrane to firmly adhere to substrate.

H. Roll seams and terminations.

I. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fish mouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.

J. Immediately install protection course with butted joints over waterproofing membrane.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests, and to furnish reports to Architect.

B. Waterproofing will be considered defective if it does not pass tests and inspections.

3.6 PROTECTION, REPAIR, AND CLEANING

A. Do not permit foot or vehicular traffic on unprotected membrane.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.

D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 07 13 26

SECTION 07 19 00 - WATER REPELLENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes water-repellent treatments for the following vertical and horizontal surfaces:

1. Masonry veneer.

B. Related Requirements:
1. Section 04 26 12 "Masonry Veneer" for brick veneer set as anchored veneer.
2. Section 07 62 00 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.3 PERFORMANCE REQUIREMENTS

A. General Performance: Water repellents shall meet performance requirements indicated without failure due to defective manufacture, fabrication, or installation.

1. Water Repellents: Comply with performance requirements specified, as determined by testing on manufacturer's standard substrate assemblies representing those indicated for this Project.

B. Water Absorption: Minimum 90 percent reduction of water absorption after 24 hours in comparison of treated and untreated specimens.

1. Precast Concrete: ASTM C 642.
2. Cast Stone: ASTM C 1195.

C. Water-Vapor Transmission: Comply with one or both of the following:

1. Maximum 10 percent reduction in rate of vapor transmission in comparison of treated and untreated specimens, according to ASTM E 96/E 96M.
2. Minimum 80 percent water-vapor transmission in comparison of treated and untreated specimens, according to ASTM D 1653.

D. Water Penetration and Leakage through Masonry: Minimum 90 percent reduction in leakage rate in comparison of treated and untreated specimens, according to ASTM E 514.

E. Durability: Maximum 5 percent loss of water-repellent properties after 2500 hours of weathering according to ASTM G 154 in comparison to water-repellent-treated specimens before weathering.

1.4 PRECONSTRUCTION TESTING

A. Preconstruction Testing: Installed water repellents shall comply with performance requirements indicated, as evidenced by reports of tests performed on manufacturer's standard substrate assemblies by a qualified testing agency.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer’s specifications, surface preparation and application instructions, recommendations for water repellents for each surface to be treated, and protection and cleaning instructions. Include data substantiating that materials are recommended by manufacturer for applications indicated and comply with requirements.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Product Certificates: For each type of water repellent, from manufacturer.

C. Preconstruction Testing Reports: For water-repellent-treated substrates.

D. Warranty: Special warranty specified in this Section.

1.7 QUALITY ASSURANCE

A. Applicator Qualifications: An employer of workers trained and approved by manufacturer.

1.8 PROJECT CONDITIONS

A. Limitations: Proceed with application only when the following existing and forecasted weather and substrate conditions permit water repellents to be applied according to manufacturers' written instructions and warranty requirements:

1. Concrete surfaces and mortar have cured for not less than 28 days.
2. Building has been closed in for not less than 30 days before treating wall assemblies.
3. Ambient temperature is above 40 deg F and below 100 deg F and will remain so for 24 hours.
4. Substrate is not frozen and substrate-surface temperature is above 40 deg F and below 100 deg F.
5. Rain or snow is not predicted within 24 hours.
6. Not less than 24 hours have passed since surfaces were last wet.
7. Windy conditions do not exist that might cause water repellent to be blown onto vegetation or surfaces not intended to be treated.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer and Applicator agree(s) to repair or replace materials that fail to maintain water repellency specified in "Performance Requirements" Article within specified warranty period.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PENETRATING WATER REPELLENTS

A. Silane, Penetrating Water Repellent: Clear, containing 20 percent or more solids of alkyltrialkoxysilanes; with alcohol, mineral spirits, water, or other proprietary solvent carrier; and with 600 g/L or less of VOCs.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Advanced Chemical Technologies, Inc.; Sil-Act Multiguard.
b. BASF Construction Chemicals, LLC; Penetrating Sealer 40 VOC.
c. ChemMasters; Aquanil Plus 40.
d. Conspec by Dayton Superior; Conspec Silane 40 WB.
e. Dayton Superior Corporation; Weather Worker J-29-WB.
f. H&C Concrete Care Products, Sherwin-Williams Company (The); H&C SL-40.
g. Nox-Crete Products Group; Stifel VC.
h. Pecora Corporation; KlereSeal 9100-S.
i. PROSOCO, Inc.; SL100.
j. Textured Coatings of America, Inc.; Rainstopper 1750 Clear.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and conditions affecting performance of the Work.

1. Verify that surfaces are clean and dry according to water-repellent manufacturer's requirements. Check moisture content in three representative locations by method recommended by manufacturer.
2. Inspect for previously applied treatments that may inhibit penetration or performance of water repellents.
3. Verify that there is no efflorescence or other removable residues that would be trapped beneath the application of water repellent.
4. Verify that required repairs are complete, cured, and dry before applying water repellent.

B. Test pH level according to water-repellent manufacturer's written instructions to ensure chemical bond to silica-containing or siliceous minerals.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Cleaning: Before application of water repellent, clean substrate of substances that could impair penetration or performance of product according to water-repellent manufacturer's written instructions and as follows:

1. Cast Stone and Precast Concrete: Remove oil, curing compounds, laitance, and other substances that inhibit penetration or performance of water repellents according to ASTM E 1857.

B. Protect adjoining work, including mortar and sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of water repellent being deposited on surfaces. Cover live vegetation.

C. Coordination with Mortar Joints: Do not apply water repellent until pointing mortar for joints adjacent to surfaces receiving water-repellent treatment has been installed and cured.

D. Coordination with Sealant Joints: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.

1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those required.

3.3 APPLICATION

A. Apply a heavy-saturation coating of water repellent, on surfaces indicated for treatment, using 15 psi- pressure spray with a fan-type spray nozzle to the point of saturation. Apply coating in dual passes of uniform, overlapping strokes. Remove excess material; do not allow material to puddle beyond saturation. Comply with manufacturer's written instructions for application procedure unless otherwise indicated.

B. Apply a second saturation coating, repeating first application. Comply with manufacturer's written instructions for limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

3.4 CLEANING

A. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Correct damage to work of other trades caused by water-repellent application, as approved by Architect.

B. Comply with manufacturer's written cleaning instructions.

END OF SECTION 07 19 00

SECTION 07 21 00 – THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation and integral vapor retarder at cavity wall construction, perimeter foundation wall, underside of floor slabs, over roof deck, over roof sheathing, and exterior wall behind masonry wall finish.
B. Batt insulation and vapor retarder in exterior wall, ceiling, and roof construction.
C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Installation requirements for board insulation over steep slope roof sheathing or roof structure.
B. Section 072600 - Vapor Retarders: Separate vapor retarder materials.
C. Section 072700 - Air Barriers: Separate air barrier materials.

1.03 DEFINITIONS

A. Mineral Fiber Material Composition: Insulation referred to as mineral fiber block, board, and blanket insulation is composed of fibers from mineral based substances such as rock, slag, or glass and processed from the molten state into fibrous form.
    1. Based on type of insulation substance, the material will be referred to as a mineral fiber when having a rock or slag base, and glass fiber with a glass or silica sand base, also considered a mineral.
    2. Insulation blankets are flexible units consisting of felted, bonded, or unbonded fibers formed into rolls or flat cut pieces referred to as batts; rolls are simply longer versions of batts.
    3. For additional information about mineral fiber and the various classification types, refer to the following reference standards; ASTM C553, ASTM C612, ASTM C665, and ASTM C726.

1.04 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
B. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.
C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
D. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).
E. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2024.
F. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.
G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
H. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
I. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2025.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
C. Shop Drawings: Submit drawings that indicate location of joint or termination detail conditions.
D. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.06 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.
B. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.

C. Insulation Over Metal Stud Framed Walls, Continuous: Extruded polystyrene (XPS) carbon black board.
D. Insulation in Metal Framed Walls: Batt insulation with integral vapor retarder.
E. Insulation over Roof Deck: Polyisocyanurate (ISO) board insulation.

2.02 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
   5. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   6. Board Edges: Square.
   7. Type and Water Absorption: Type XII, 0.3 percent by volume, maximum, by total immersion.
   8. Products:
      a. DuPont de Nemours, Inc; Styrofoam Brand.
      b. Kingspan Insulation LLC; GreenGuard GG25-LG XPS Insulation Board
      c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation
      d. Substitutions: See Section 016000 - Product Requirements.
B. Extruded Polystyrene (XPS) Continuous Insulation (CI) Board: Comply with ASTM C578, and manufactured using carbon black technology.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.6 (0.98), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
   4. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
   5. Board Thickness: 3 inch (76 mm).

6. Board Edges: Shiplap, at long edges.

7. Products:

C. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, comply with ASTM C1289.

1. Classifications:

a. Type V: Faced with oriented strand board (OSB) or plywood on one major surface of the core foam and faced on the other major surface with any facer described in this specification.

1) Compressive Strength: 16 psi (110 kPa), minimum.

2) Thermal Resistance, R-value (RSI-value): At 1-1/2 inch (38.1 mm) thick; 6.2 (1.09), minimum, at 75 degrees F (24 degrees C).

2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.

3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.

4. Water Vapor Permeance: 1.2 perm (68 ng/(Pa s sqm)), maximum, at 1 inch (25 mm) thickness, and when tested in accordance with ASTM E96/E96M, desiccant method.

5. Comply with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.

6. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).

7. Board Thickness: 4.0 inch (102 mm).

8. Board Edges: Square.

9. Products:

a. Carlisle Coatings & Waterproofing, Inc
b. GAF; EnergyGuard NH Barrier Polyiso Roof Insulation
c. Johns Manville
d. Rmax Inc.
e. Substitutions: See Section 016000 - Product Requirements.

2.03 MINERAL FIBER BLANKET INSULATION MATERIALS

A. Mineral Wool Blanket Thermal Insulation: Flexible or semi-rigid preformed insulation, complying with ASTM C665.

1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.

2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.

3. Products:

a. Johns Manville; MinWool Sound Attenuation Fire Batts
b. Nu-Wool; ECOCELL
c. ROCKWOOL; COMFORTBATT
d. Thermafiber, Inc; SAFB
e. Substitutions: See Section 016000 - Product Requirements.

2.04 ACCESSORIES

A. Sheet Vapor Retarder: See Section 072600.
B. Foundation Insulation and Drainage Board: Flexible board comprised of majority post-industrial recycled content, providing both subgrade insulation and drainage.
   1. Application: Install vertically directly against acceptable substrates.
   2. Board Thickness: 2-1/2 inches (63.5 mm).
   3. Water Permeability of Geotextiles by Permittivity: 47.2 gpm/sq ft, 3/4 inch (19.1 mm), measured in accordance with ASTM D4491/D4491M.
   4. Index Puncture Resistance of Geomembranes and Related Products: 54 lb, 3/4 inch (25.5 kg, 19.1 mm), in accordance with ASTM D4833/D4833M.
   5. Steady-State Thermal Transmission Properties: R-value (RSI-value) of 3 (0.53) for 3/4 inch (19.1 mm) thickness, in accordance with ASTM C518.
   6. Products:
      a. Nu-Wool; INSULDRI
      b. Substitutions: See Section 016000 - Product Requirements.
C. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
   1. Application: Sealing of interior circular penetrations, such as pipes or cables.
   2. Width: Are required for application.
   3. Temperature Resistance: Range of minus 40 to 212 degrees F (minus 40 to 100 deg.C).
D. Support for Cladding and Continuous Insulation: Continuous thermal Z-girts.
   1. Fiberglass reinforced plastic (FRP) girts that provide cladding attachment support for exterior wall cladding, brick veneer, CMU veneer, metal wall panels, and siding,
   2. Depth: As required for thickness of insulation.
   3. Fasteners: As recommended by clip manufacturer.
   4. Products:

a. Advanced Architectural Products, LLC; SMARTci
b. Armatherm; Z Girt Structural Thermal Break
c. Cladiator; Slotted-Z FG
d. exo Surfaces; exoGIRT
e. Substitutions: See Section 016000 - Product Requirements.

E. Protection Board for Below Grade Insulation: Cementitious, 1/4 inch (6 mm) thick.
F. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

4.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards horizontally on foundation perimeter.
B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

4.03 BOARD INSTALLATION AT EXTERIOR WALLS

A. Install boards horizontally on walls.
1. Install in running bond pattern.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

4.04 Board Installation Using Cladding and Continuous Insulation Supports

A. Install supports in accordance with manufacturer's installation instructions.
B. Install supports in compliance with system orientation, sizes, and locations as indicated on drawings and in accordance with approved shop drawings.
C. Install supports to fill in exterior wall spaces without gaps or voids in insulation.
D. Trim insulation neatly to fit spaces and provide a continuous thermal layer.

4.05 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.
B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

4.06 BATT INSTALLATION

A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.
C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
E. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over face of member
F. Tape seal tears or cuts in vapor retarder.
G. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane; tape seal in place.
H. Coordinate work of this section with requirements for vapor retarder, see Section 072600.
I. Coordinate work of this section with construction of air barrier seal, see Section 072700.

4.07 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

4.08 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 21 00

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SECTION 07 21 19 - FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Foamed-in-place insulation.
   1. In masonry cavity walls.
   2. In exterior framed walls.
   3. In exterior wall crevices.
   4. At junctions of dissimilar wall and roof materials.

1.02 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
B. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2025.
C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
E. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
F. NFPA 275 - Standard Method of Fire Tests for the Evaluation of Thermal Barriers; 2022.
G. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
H. UL 1040 - Standard for Safety Fire Test of Insulated Wall Construction; Current Edition, Including All Revisions.
I. UL 1715 - Standard for Safety Fire Test of Interior Finish Material; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements.
C. Certificates: Certify that products of this section meet or exceed specified requirements.
D. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.

E. Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

F. Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience, and approved by manufacturer.

1.05 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

B. Do not apply foam when temperature is within 5 degrees F (2.78 degrees C) of dew point.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Foamed-In-Place Insulation:

1. BASF Corporation; WALLTITE US Series Closed Cell
2. Carlisle Spray Foam Insulation
3. Gaco Western
4. Henry, a Carlisle Company
5. Huntsman Building Solutions
6. Johns Manville; JM No Mix Open Cell (NMOC)
7. NCFI Polyurethanes
8. Preferred Solutions, Inc
9. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

A. Foamed-In-Place Insulation: Low-density, flexible, closed cell, water vapor permeable polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.

1. Thermal Resistance: R-value (RSI-value) of 3.0 (0.53), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature when tested in accordance with ASTM C518.
2. Air Permeance: 0.04 cfm per square foot (0.2 L/(s/sq m)), maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf (75 Pa).
3. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
4. Substitutions: See Section 016000 - Product Requirements.

B. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and fire protection requirements.
    a. Fire Protection: Provide 15-minute thermal barrier of 1/2 inch (12.7 mm) gypsum board or equivalent material complying with NFPA 275 test method, or foamed-in-place insulation either exposed or with covering that complies with FM 4880, NFPA 286, UL 1040, or UL 1715.
2. Thermal Resistance: R-value (RSI-value) of 7.1 (1.25), minimum, per 1-inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature when tested in accordance with ASTM C518.
3. Water Vapor Permeance: Vapor retarder; 2 perms (115 ng/(Pa s sq m)), maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
4. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
5. Air Permeance: 0.04 cfm per square foot (0.2 L/(s/sq m)), maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf (75 Pa).
6. Closed Cell Content: At least 90 percent.
7. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
8. Products:
    a. BASF Corporation; WALLTITE US

b. Gaco Western; GacoOnePass F1850R
c. Henry, a Carlisle Company
d. Johns Manville; JM IV HFO Closed-cell
e. NCFI Polyurethanes; InsulStar 1.7 HFO 11-033
f. Nu-Wool; Nu-Seal Plus
g. Preferred Solutions, Inc; Staycell 504 Closed Cell Spray Foam Insulation

9. Substitutions: See Section 016000 - Product Requirements.

2.03 ACCESSORIES

A. Primer: As required by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete before insulation application.
B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.02 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.
B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.
B. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.
C. Trim excess away for applied trim or remove as required for continuous sealant bead.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.
B. Field inspections and tests will be performed by an independent testing agency.

3.05 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION 07 21 19

SECTION 07 26 00 – VAPOR RETARDERS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.
B. Section 061000 - Rough Carpentry: Vapor retarders on exterior wall sheathing.
C. Section 072100 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.
D. Section 076200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with vapor retarders.

1.02 DEFINITIONS

A. Vapor Retarder: Airtight barrier made of material that is relatively water vapor impermeable, to degree specified, with seams and joints sealed to adjacent surfaces.
B. Vapor Retarder Class: A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class is defined using Procedure A, Desiccant Method at 73 degrees F (23 degrees C) and 50 percent Relative Humidity (RH), in accordance with ASTM E96/E96M and ICC (IBC)-2018, as follows:
    1. Class I: 0.1 perm or less.
    2. Class II: Greater than 0.1 perm to 1.0 perm.
    3. Class III: Greater than 1.0 perm to 10 perms.

1.03 REFERENCE STANDARDS

A. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications; 2016 (Reapproved 2023).
B. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
C. ICC (IBC)-2018 - International Building Code; 2018.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
C. Shop Drawings: Provide drawings of special joint conditions.
D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

E. Installer's qualification statement.

1.05 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 VAPOR RETARDERS

A. Underslab Vapor Retarders: See Section 033000.
B. Vapor Retarder Sheet: Polyethylene sheeting complying with ASTM D4397, clear colored.
   1. Thickness: 10 mil, 0.010 inch (0.254 mm), nominal.
   2. Water Vapor Permeance: 0.1 perm, maximum, when tested in accordance with ASTM E96/E96M.
   3. Seam and Perimeter Tape: Polyethylene self-adhering type, mesh reinforced, 2 inches (50 mm) wide; compatible with sheet material.

2.02 ACCESSORIES

A. Sealants, Tapes, and Accessories for Sealing Vapor Retarder and Adjacent Substrates: As indicated, complying with vapor retarder manufacturer's installation instructions.
B. Vapor Retarder Tape: Coated polyester film with acrylic adhesive backing; pressure sensitive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions comply with requirements of this section.

3.02 PREPARATION

A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
B. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's installation instructions.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's installation instructions.

B. Vapor Retarders: Install continuous airtight barrier over surfaces indicated, with sealed seams and sealed joints to adjacent surfaces.

C. Apply sealants and adhesives within recommended temperature range in accordance with manufacturer's installation instructions.

D. Mechanically Fastened Sheets - Vapor Retarder On Interior:

1. When insulation is installed within assembly, install vapor retarder over insulation.
2. Anchor to metal framing using seam tape, adhering at least one-half of tape width to metal substrate.
3. Seal seams, laps, perimeter edges, penetrations, tears, and cuts with self-adhesive tape, providing an airtight seal.
4. Locate laps at framing members; at laps fasten one sheet to framing member then tape overlapping sheet to first sheet in shingle fashion to shed water.
5. Seal entire perimeter to structure, window and door frames, and other penetrations.
6. Where conduits, pipes, wires, ducts, outlet boxes, and other items are installed within insulation cavity, pass vapor retarder sheet behind these items and over insulation to maintain airtight seal.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Owner’s Inspection and Testing: Cooperate with Owner’s testing agency.

1. Allow access to work areas and staging.
2. Notify Owner’s testing agency in writing of schedule for work of this section to allow sufficient time for testing and inspection.
3. Do not cover work of this section until testing and inspection is accepted.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION 07 26 00

SECTION 07 27 26 – FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Fluid-applied membrane air barriers.

2.02 RELATED REQUIREMENTS

A. Section 054000 - Cold-Formed Metal Framing: Exterior metal stud walls.
B. Section 061000 - Rough Carpentry: Exterior sheathing.
C. Section 079200 - Joint Sealants: Sealants applied to adjacent work.

2.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
B. ASTM C719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle); 2022.
C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
D. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
F. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
G. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.

2.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
C. Shop Drawings: Provide drawings of special joint conditions.
D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.
E. Installer's qualification statement.
F. Warranty Documentation: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

2.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

2.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in original packaging with seals unbroken and properly labeled.
B. Store materials in their original undamaged packaging within clean, dry, and protected location at a temperature less than 90 degrees F (32 degrees C).

2.07 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by materials manufacturer before, during, and after installation.
    1. Do not apply air barrier products when air or substrate temperatures are above 100 degrees F (38 degrees C) or below 20 degrees F (minus 6 degrees C).
    2. Allow wet substrates to dry prior to applying air barrier products.

2.08 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

3.01 MANUFACTURERS

A. Fluid-Applied Membrane Air Barrier:
B. Basis-of-Design Product: Subject to compliance with requirements, provide DuPont de Nemours, Inc.; DuPont Tyvek Fluid Applied WB. or a comparable product by one of the following:
    1. 3M Industrial Adhesives and Tapes Division.
    2. Carlisle Coatings & Waterproofing Inc.
    3. GE Construction Sealants; Momentive Performance Materials Inc.
    4. Hohmann & Barnard, Inc.
    5. Mar-flex Waterproofing & Building Products.
    6. Rubber Polymer Corporation, Inc.
    7. Sto Corp.

8. TK Products.
9. W.R. Meadows, Inc.
10. Substitutions: See Section 016000 - Product Requirements.

3.02 FLUID-APPLIED MEMBRANE AIR BARRIER ASSEMBLY

A. Applications:
   1. Exterior Sheathing on Steel Stud Walls:
      a. See Section 054000 for steel studs.
      b. See Section 061000 for exterior sheathing.
      c. See Section 079200 for joint sealants applied to adjacent work.

B. Fluid-Applied Membrane Air Barrier: Single-component, vapor permeable, 100 percent silicone elastomeric air barrier.
   1. Vapor Permeance: 10 perms (574 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Desiccant Method at 73.4 degrees F (23 degrees C).
   2. Air Barrier Leakage: Not greater than 0.04 cfm/sq ft (0.2 L/sq m) of surface area at pressure of 1.57 psf (75 Pa) when tested in accordance with ASTM E2357.
   3. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
   4. Ultimate Elongation: Minimum 250 percent; ASTM D 412, Die C.
   5. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D 4541.
   6. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
   7. UV Resistance: Can be exposed to sunlight for 180 days according to manufacturer's written instructions.

C. Silicone Weather Barrier Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT; not expected to withstand continuous water immersion or traffic.
   1. Joint Movement Capability: Plus or minus 25 percent, minimum, when tested in accordance with ASTM C719.
   2. Tensile Strength: Greater than 200 psi (1.4 MPa), when tested in accordance with ASTM D412.

3. Hardness: Greater than 30 durometer Shore A, when tested in accordance with ASTM C661.
4. Color: White.
5. Cure Type: Single-component, neutral-cure, room temperature vulcanizing (RTV) silicone sealant.
6. Products:
    a. Dow; DOWSIL 758 Silicone Weather Barrier Sealant: www.dow.com/#sle.
    b. Substitutions: See Section 016000 - Product Requirements.

3.03 ACCESSORIES

A. Thinners and Cleaners: As recommended by material manufacturer.
B. Crack Fillers: Provide substrate manufacturer's recommended crack fillers or sealants compatible with air barrier assembly components and adjacent materials.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept work of this section.
B. Verify that surfaces are clean, dry, and free of frost, dust, dirt, grease, oil, curing compounds, form release agents, laitance, efflorescence, mildew, excess alkalinity, and other conditions affecting performance of this work.
C. Proceed with work once conditions comply with air barrier coating manufacturer's recommendations.

4.02 PREPARATION

A. Protect work of other trades against damage from application of air barrier coatings.
B. Protect adjacent surfaces not designated to receive air barrier coatings; provide protection for pedestrians, vehicles, landscaping, and surrounding areas to prevent contact with coating materials.
C. Clean substrates to remove contaminants and foreign material by pressure cleaning, wire brushing, grinding or other method recommended by air barrier coatings manufacturer.
D. Prepare substrates in accordance with air barrier coating manufacturer's written instructions.
E. Repair deteriorated or damaged substrates, repair masonry joints, and fill cracks, voids, honeycombs, and other defects using materials as recommended by air barrier coating manufacturer, and allow patching materials to fully cure.

1. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
2. Fill cracks larger than 1/16 inch (1.6 mm) wide using applicable joint sealant, and fill cracks larger than 1 inch (25.4 mm) wide using joint sealant and compatible bond breaker where movement is expected.

4.03 APPLICATION

A. Apply air barrier system materials in accordance with manufacturer's instructions.
B. Transition Strips and Silicone Sealants: Install with approved sealants in accordance with manufacturer’s written instructions.
   1. Form sealed joints to windows, wall framing systems, door and louver frames, roofing system perimeters, and at interface with other adjacent materials utilizing compatible components that form air barrier assembly.
C. Air Barrier Coating: Apply air barrier coating using application methods and rate of application recommended by manufacturer, using nap roller or airless sprayer, in accordance with requirements of authorities having jurisdiction (AHJ).
   1. Provide wet application not less than 30 mils, 0.030 inch (0.76 mm) thick, or more as required by substrate conditions, with dry film thickness (DFT) not less than 15 mils, 0.015 inch (0.38 mm) thick.
   2. Apply additional coats as required to provide uniform, continuously cured, airtight and watertight film.

4.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.
B. Do not cover installed air barriers until required inspections have been completed.
C. Owner may retain testing agency to perform the following tests:
   1. Verification that substrate preparation meets requirements.
   2. Testing and certification that coating materials comply with requirements for thickness and continuity.
   3. Testing of application for compliance with adhesion and film thickness requirements.

4.05 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
B. During completion of this work, remove overspray and excess material, using materials and methods approved by manufacturer that will not damage adjacent materials.
C. Clean and repair adjacent surfaces damaged by air barrier coating application.

4.06 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.
B. Allow air barrier coatings to fully cure before exposure to traffic or other construction operations.
C. Prevent damage to coatings from construction operations or other causes.
D. Replace damaged air barrier coatings prior to concealment behind subsequent construction.

END OF SECTION 072726

SECTION 07 31 13 – ASPHALT SHINGLES

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Asphalt shingle roofing.
B. Flexible sheet membranes for eave protection, underlayment, and valley protection.
C. Flashing.

2.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Roof sheathing.
B. Section 072100 - Thermal Insulation: Nailable rigid insulation.
C. Section 076200 - Sheet Metal Flashing and Trim: Edge and cap flashings.

2.03 REFERENCE STANDARDS

A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
B. ASTM D3161/D3161M - Standard Test Method for Wind Resistance of Steep Slope Roofing Products (Fan-Induced Method); 2020 (Reapproved 2025).
C. ASTM D3462/D3462M - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules; 2023.
D. ASTM D4869/D4869M - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing; 2016a (Reapproved 2021).
E. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2025.
F. ASTM F1667/F1667M - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples; 2021a.
G. NRCA (RM) - The NRCA Roofing Manual; 2025.
H. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.
I. UL (DIR) - Online Certifications Directory; Current Edition.

2.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data indicating material characteristics, performance criteria, limitations.
C. Shop Drawings: For metal flashings, indicate specially configured metal flashings, jointing methods and locations, fastening methods and locations, installation details.

D. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern; for color selection.
E. Manufacturer's Installation Instructions: Indicate installation criteria and procedures.
F. Manufacturer's qualification statement.
G. Installer's qualification statement.
H. Warranty Documentation: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 016000 - Product Requirements for additional provisions.

2.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacture of roofing systems similar to those required for this project, with not less than 10 years of documented experience.
B. Installer Qualifications: Company specializing in installing asphalt shingles, with at least 5 years of documented experience.

2.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store materials with labels intact in manufacturer's unopened packaging until ready for installation.
B. Store materials under dry and waterproof cover, well ventilated, and elevated above grade on a flat surface.
C. Protect materials from harmful environmental elements, construction dust, direct sunlight, and other potentially detrimental conditions.
D. When storing roofing materials on roofing system ensure no damage occurs to supporting members and other materials.

2.07 FIELD CONDITIONS

A. Do not install shingles, eave protection membrane or underlayment when surface, ambient air, or wind chill temperatures are below 45 degrees F (7 degrees C).

2.08 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Provide lifetime manufacturer's warranty for coverage against black streaks caused by algae.
C. Provide 5-year manufacturer's warranty for wind damage.
D. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

3.01 MANUFACTURERS

A. Asphalt Shingles:
   1. Atlas Roofing Corporation
   2. CertainTeed Roofing
   3. GAF; Timberline UHD Shingles
   4. Malarkey Roofing; Highlander AR (Basis-of-Design)
   5. Owens Corning Corporation

3.02 ASPHALT SHINGLES

A. Asphalt Shingles: Asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.
   1. Fire Resistance: Class A, complying with ASTM E108.
   2. Wind Resistance: Class A, when tested in accordance with ASTM D3161/D3161M.
   3. Fire or Wind Resistance Criteria: Provide UL (DIR) listed and labeled products.
   4. Warranted Wind Speed: Not greater than 90 mph (145 km/h).
   5. Self-sealing type.
   6. Style: Staggered edge butt.
   7. Color: As selected by Architect.

3.03 SHEET MATERIALS

A. Underlayment: Synthetic non-asphaltic sheet, intended by manufacturer for mechanically fastened roofing underlayment without sealed seams.
   1. Type: Woven polypropylene with anti-slip polyolefin coating on both sides.
   2. Self Sealability: Passing nail sealability test specified in ASTM D1970/D1970M.
   3. Low Temperature Flexibility: Passing test specified in ASTM D1970/D1970M.
   4. Liquid Water Transmission: Passes ASTM D4869/D4869M.
   5. Functional Temperature Range: From minus 70 degrees F (minus 56.7 degrees C) to 212 degrees F (100 degrees C).

6. Fasteners: As recommended by manufacturer or building code qualification report or approval.

3.04 Flashing

A. Metal Flashings: Provide sheet metal eave edge, gable edge, ridge, ridge vents, open valley flashing, chimney flashing, dormer flashing, and other flashing as indicated.
   1. Form flashings to profiles indicated on drawings.
   2. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
   3. Hem exposed edges of flashings minimum 1/4 inch (6 mm) on underside.

B. Flexible Flashing: Self-adhering polymer-modified asphalt sheet complying with ASTM D1970/D1970M; 40-mil, 0.040-inch (1 mm) total thickness; with strippable treated release paper and polyethylene sheet top surface.

3.05 ACCESSORIES

A. Roofing Nails: Standard round wire shingle type, galvanized steel, stainless steel, aluminum roofing nails, or copper roofing nails, minimum 3/8-inch (9.5 mm) head diameter, 12-gauge, 0.109-inch (2.77 mm) nail shank diameter, 1-1/2 inches (38 mm) long and complying with ASTM F1667/F1667M.
B. Bituminous Paint: Acid and alkali resistant type; black color.
C. Plastic Ridge Vents: Extruded plastic with vent openings do not permit direct water or weather entry; flanged to receive shingles.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify existing conditions prior to starting this work.
B. Verify roof deck is of sufficient thickness to accept fasteners.
C. Verify roof penetrations and plumbing stacks are in place and flashed to deck surface.
D. Verify roof openings are correctly framed.
E. Verify deck surfaces are dry, free of ridges, warps, or voids.

4.02 PREPARATION

A. Seal roof deck joints wider than 1/16 inch (1.5 mm) as recommended by shingle manufacturer.

B. Broom clean deck surfaces before installing underlayment or eave protection.

C. Protect surrounding areas and adjacent surfaces from damage during execution of this work.

D. Install eave edge flashings tight with fascia boards, weather lap joints 2 inches (50 mm) and seal with roof cement, and secure flange with nails spaced 6 inches on center.

4.03 INSTALLATION

A. Underlayment:

1. Roof Slopes Up to 4:12: Install two layers of underlayment over area not protected by eave protection, with ends and edges weather lapped minimum 4 inches (100 mm); stagger end laps of each consecutive layer and nail in place.

2. Weather lap and seal watertight with plastic cement any items projecting through or mounted on roof.

B. Valley Protection:

1. Install valley protection in accordance with SMACNA (ASMM) and as indicated on drawings.

2. Install flexible flashing in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

3. At Exposed Valleys: Install one layer of sheet metal flashing, minimum 24 inches (600 mm) wide, centered over open valley and crimped to guide water flow. Weather lap joints minimum 2-inch (50 mm) wide band of lap cement along each edge of first layer, press roll roofing into cement, and nail in place minimum 18 inches (450 mm) on center and 1 inch (25 mm) from edges.

C. Metal Flashing:

1. Install flashings in accordance with manufacturer's instructions and SMACNA Architectural Sheet Metal Manual requirements.

2. Weather lap joints minimum 2 inches (50 mm) and seal weather tight with plastic cement.

3. Secure in place with nails at 6 inches on center, and conceal fastenings.

4. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.

D. Shingles:

1. Install shingles in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
    a. Fasten individual shingles using two nails per shingle, or as required by manufacturer and local building code, whichever is greater.
    b. Fasten strip shingles using four nails per strip, or as required by manufacturer and local building code, whichever is greater.
2. Place shingles in straight coursing pattern with 5-inch (125 mm) weather exposure to produce double thickness over full roof area, and provide double course of shingles at eaves.
3. Project first course of shingles 3/4 inch (19 mm) beyond fascia boards.
4. Extend shingles 1/2 inch (13 mm) beyond face of gable edge fascia boards.
5. Complete installation to provide weathertight service.

4.04 CLEANING

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
B. Clean exposed work upon completion of installation; remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to finish.

4.05 PROTECTION

A. Do not permit traffic over finished roof surface; protect roofing until completion of project.
B. Touch-up, repair, or replace damaged asphalt shingles or accessories before Date of Substantial Completion.

END OF SECTION 073113

SECTION 07 62 00 SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashing, gutters, downspouts, and exterior penetrations.
B. Sealants for joints within sheet metal fabrications.

2.02 RELATED REQUIREMENTS

2.03 REFERENCE STANDARDS

A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
D. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
E. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products; 2018.
F. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
G. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
H. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2024).
I. CDA A4050 - Copper in Architecture - Handbook; Current Edition.
J. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
K. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

2.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

2.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with five years of documented experience.

2.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

3.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24-gauge, 0.0239-inch (0.61 mm) thick base metal.
B. Anodized Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 0.032 inch (0.81 mm) thick; anodized finish of color as selected.
    1. Color Anodized Finish: AAMA 611, AA-M12C22A42/44, Class I, integrally or electrolytically colored anodic coating not less than 0.7 mil, 0.0007 inch (0.018 mm) thick.
C. Stainless Steel: ASTM A666/A666M, Type 304 alloy, soft temper, 28 gauge, 0.0156 inch (0.40 mm) thick; smooth No. 4 - Brushed finish.

3.02 Prefinished Aluminum Sheets

A. Description: Factory-applied topcoat systems applied to aluminum flat sheet substrates prior to fabrication by coil coating; topcoat systems consist of primers and organic topcoats on exposed side and backing coats on unexposed side.
B. Aluminum Sheet Substrates: ASTM B209/B209M, alloy and temper as recommended by manufacturer for application.
C. High-Performance Organic Coating System: Comply with AAMA 2604 for aluminum preparation, pretreatment, primer and finish coat system; provide thermally cured, 50-percent PVDF or silicone-modified polyester systems; tested for weathering for 5 years with 5 delta units color change maximum.
D. Application: Flashing, Counterflashing, Ledge Flashing, Sill Flashing, Fascia, Drip Fascia, Edge Fascia, Gutters, Downspouts, Trim, and Edge Trim.
    1. Drawing Detail: As indicated on drawings.

2. Base Metal Thickness: 0.040 inch (1.0 mm), minimum.
3. Coating System: High-performance organic coating system.
4. Color: As selected by Architect from manufacturer's standard colors.

3.03 Prepainted, Metallic-Coated Steel Sheets

A. Description: Factory-applied coatings applied to metallic-coated steel sheet substrates prior to fabrication by coil coating; topcoat systems consist of primers and organic topcoats on exposed, top side of sheet; washcoats on bottom, unexposed sheet side.
B. Comply with ASTM A755/A755M.
C. Metallic-Coated Steel Sheet Substrates:
D. Substrate Preparation for Prefinishing: Clean and prepare substrate surfaces in accordance with coating manufacturer's recommendations for substrate type and application.
E. Washcoats or Backercoats: Provide washcoats or backercoats in accordance with organic coating manufacturer's recommendations.
F. Primer Coats: Provide basecoat primers in accordance with coating manufacturer's recommendations for substrate type, topcoat, and application.
G. High-Performance Organic Coating System: Provide thermally cured, 50-percent PVDF or silicone-modified polyester systems in accordance with AAMA 2604; tested for weathering for 5 years with 5 delta units maximum of color change.

3.04 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Form pieces in longest possible lengths.
C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.
D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
E. Fabricate corners from one piece with minimum 18-inch (450 mm) long legs; seam for rigidity, seal with sealant.
F. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

3.05 GUTTERS AND DOWNSPOUTS

A. Gutters: SMACNA (ASMM) Rectangular profile.
B. Downspouts: Rectangular profile.
C. Gutters and Downspouts: Size for rainfall intensity determined by a storm occurrence of 1 in 10 years in accordance with ICC (IPC).

D. Accessories: Profiled to suit gutters and downspouts.
   1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
   2. Gutter Supports: Brackets.
   3. Downspout Supports: Brackets.

E. Downspout Shoes: Steel.
F. Downspout Extenders: Same material and finish as downspouts.
G. Seal metal joints.

3.06 Flashing

A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

3.07 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.
B. Underlayment: Polyethylene, 6 mil, 0.006 inch (0.15 mm) thick.
C. Primer Type: Zinc chromate.
D. Concealed Sealants: Non-curing butyl sealant.
E. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
F. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
B. Verify roofing termination and base flashings are in place, sealed, and secure.

4.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.
B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch (0.38 mm).

4.03 INSTALLATION

A. Comply with drawing details.

B. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant.
C. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.
D. Apply plastic cement compound between metal flashings and felt flashings.
E. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
F. Secure gutters and downspouts in place with concealed fasteners.
G. Slope gutters 1/4 inch per 10 feet (2.1 mm per m), minimum.
H. Connect downspouts to downspout shoes, and grout connection watertight.

4.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for field inspection requirements.
B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION 076200

SECTION 07 92 00 – JOINT SEALANTS

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.
B. Self-leveling pourable joint sealants.
C. Joint backings and accessories.
D. Owner-provided field quality control.

2.02 RELATED REQUIREMENTS

A. Section 092116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

2.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.
E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
F. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.
G. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2020).
H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

2.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
    1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.

2. List of backing materials approved for use with the specific product.
3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
4. Substrates the product should not be used on.
5. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
6. Sample product warranty.
7. Certification by manufacturer indicating that product complies with specification requirements.

C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.
F. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
G. Field Quality Control Plan: Submit at least two weeks prior to start of installation.
H. Field Quality Control Log: Submit filled-out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.
I. Installer's qualification statement.
J. Executed warranty.

2.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.
B. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Adhesion Testing: In accordance with ASTM C794.
   2. Compatibility Testing: In accordance with ASTM C1087.
   3. Allow sufficient time for testing to avoid delaying the work.

4. Deliver sufficient samples to manufacturer for testing.
5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

D. Owner will employ an independent testing agency to perform the field quality control inspection and testing as referenced in PART 3 of this section and as follows, to prepare and submit the field quality control plan and log, and to provide recommendations of remedies in the case of failure.

E. Field Quality Control Plan:
1. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

F. Nondestructive Field Adhesion Test: Test for adhesion in accordance with ASTM C1521, using Nondestructive Spot Method.

2.06 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

3.01 JOINT SEALANT APPLICATIONS

A. Scope:
1. Exterior Joints:
a. Seal the following joints:
1) Wall expansion and control joints.
2) Joints between doors, windows, and other frames or adjacent construction.
3) Joints between different exposed materials.
2. Interior Joints:
a. Seal open joints except specific open joints indicated on drawings as not sealed.
3. Do Not Seal:
a. Intentional weep holes in masonry.

b. Joints indicated to be covered with expansion joint cover assemblies.

c. Joints where sealant installation is specified in other sections.

3.02 JOINT SEALANTS - GENERAL

3.03 NONSAG JOINT SEALANTS

A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

B. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.

1. Movement Capability: Plus and minus 35 percent, minimum.

2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.

3. Color: Match adjacent finished surfaces.

4. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).

5. Products:

a. Sika Corporation; Sikaflex-1a

b. Sika Corporation; Sikaflex-2c NS

c. Substitutions: See Section 016000 - Product Requirements.

C. Nonsag Traffic-Grade Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.

1. Movement Capability: Plus and minus 25 percent, minimum.

2. Hardness Range: 20 to 30, Shore A, when tested in accordance with ASTM C661.

3. Color: Match adjacent finished surfaces.

4. Products:

a. Mapei; Mapeiflex P2 NS

b. Substitutions: See Section 016000 - Product Requirements.

D. Polysulfide Sealant for Continuous Water Immersion: Polysulfide; ASTM C920, Grade NS, Uses M and A; single component; explicitly approved by manufacturer for continuous water immersion; not expected to withstand traffic.

1. Movement Capability: Plus and minus 25 percent, minimum.

2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.

3. Color: Match adjacent finished surfaces.
4. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).
5. Products:
    a. Pecora Corporation; Synthacalk GC2+
    b. W. R. Meadows, Inc; Deck-O-Seal Gun Grade
    c. Substitutions: See Section 016000 - Product Requirements.

3.04 SELF-LEVELING JOINT SEALANTS

A. Self-Leveling Polyurethane Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent; explicitly approved by manufacturer for traffic exposure; not expected to withstand continuous water immersion .
    1. Movement Capability: Plus and minus 25 percent, minimum.
    2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
    3. Color: Gray.
    4. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).
    5. Products:
        a. Pecora Corporation
        b. Polycoat Products
        c. Sherwin-Williams Company; Stampede 1SL Polyurethane Sealant
        d. Sika Corporation; Sikaflex-1c SL
        e. Substitutions: See Section 016000 - Product Requirements.
B. Self-Leveling Polyurethane Sealant for Continuous Water Immersion: Polyurethane; ASTM C920, Grade P, Uses M and A; single component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
    1. Movement Capability: Plus, and minus 25 percent, minimum.
    2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
    3. Color: Gray.
    4. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).
    5. Products:
        a. Sika Corporation; Sikaflex-1c SL
        b. Sika Corporation; Sikaflex-2c SL
        c. W. R. Meadows, Inc; POURTHANE SL
        d. Substitutions: See Section 016000 - Product Requirements.

C. Rigid Self-Leveling Polyurethane Joint Filler: Two part, low viscosity, fast setting; intended for cracks and control joints not subject to significant movement.
   1. Hardness Range: Greater than 100, Shore A, and 50 to 80, Shore D, when tested in accordance with ASTM C661.

3.05 ACCESSORIES

A. Sealant Backing Rod, Closed-Cell Type:
   1. Cylindrical flexible sealant backings complying with ASTM C1330 Type C.
B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
C. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
D. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify that joints are ready to receive work.
B. Verify that backing materials are compatible with sealants.
C. Verify that backer rods are of the correct size.

4.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.
B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

4.03 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
B. Provide joint sealant installations complying with ASTM C1193.
C. Install bond breaker backing tape where backer rod cannot be used.
D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

4.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for additional requirements.

B. Owner will employ an independent testing agency to perform field quality control inspection and testing as specified in PART 1 under QUALITY ASSURANCE article.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION 07 92 00

SECTION 08 06 71 – DOOR HARDWARE SCHEDULE

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Preliminary schedule of door hardware sets for swinging as indicated on drawings.

2.02 RELATED REQUIREMENTS

A. Section 087100 - Door Hardware: Requirements to comply with in coordination with this section.

2.03 REFERENCE STANDARDS

A. BHMA (CPD) - Certified Products Directory; Current Edition.
B. BHMA A156.3 - Exit Devices; 2025.
C. BHMA A156.5 - Cylinders and Input Devices for Locks; 2020.
D. BHMA A156.13 - Mortise Locks & Latches Series 1000; 2022.
E. BHMA A156.18 - Standard for Materials and Finishes; 2020.
F. DHI (H&S) - Sequence and Format for the Hardware Schedule; 2019.

2.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

3.01 MANUFACTURERS

A. Only manufacturers listed in Door Hardware Schedule or Section 087100 are considered acceptable, unless noted otherwise.
B. Obtain each type of door hardware as indicated from a single manufacturer and single supplier.
C. Products are listed and certified compliant with specified standards by BHMA (CPD).
D. Manufacturer's Abbreviations: Coordinate with manufacturers listed in Section 087100.

3.02 DESCRIPTION

A. Door hardware sets provided represent the design intent, they are only a guideline and should not be considered a detailed or complete hardware schedule.
   1. Provide door hardware item(s) as required for similar purposes, even when item is not listed for a door in Door Hardware Schedule.
   2. Necessary items that are not included in a Hardware Set should be added and have the appropriate additional hardware as required for proper application and functionality.
   3. Door hardware supplier is responsible for providing proper size and hand of door for products required in accordance with Door Hardware Schedule and as indicated on drawings.
   4. Quantities listed are for each Pair (PR) of doors, or for each Single (SGL) door, as indicated in hardware sets.

3.03 LOCK FUNCTION CODES

A. Function Codes for Cylindrical Locks: Complying with BHMA A156.5.
   1. Code F86; Storeroom Lock: Outside knob/lever always locked/rigid. Latchbolt retracted by key in outside knob/lever or by rotating inside knob/lever. Inside knob/lever always free. Deadlocking latchbolt.

B. Function Codes for Mortise Locks: Complying with BHMA A156.13.

C. Function Codes for Exit Devices: Complying with BHMA A156.3.

3.04 FINISHES

A. Finishes: Complying with BHMA A156.18.
   1. Code 626: Satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D).

PART 3 EXECUTION

4.01 DOOR HARDWARE SCHEDULE

A. Organize listing of door hardware components within each hardware set in compliance with 10-Part scheduling sequence indicated in DHI (H&S), unless otherwise indicated.

4.02 HARDWARE SET # 01: "STORE ROOM"

A. Provide for each Single (SGL) door(s).

UNITS	LOCK	ITEM	DESCRIPTION	FINISH	MFR
3 Each		HINGE	5BB1 4.5 X 4.5	652	IVE
1 Each	F86	STOREROOM LOCK	L9080HD	626	SCH
1 Each		PERMANENT CORE	OWNER SUPPLIED	626	BAS
1 Each		OH STOP	410S	630	IVE
1 Each		SURFACE CLOSER	4011	689	LCN
1 Each		MOUNTING PLATE	4010-18	689	LCN
1 Each		KICK PLATE	8400 10' X 2' LDW	630	IVE
1 Each		SILENCER	SR64	GRY	IVE

END OF SECTION 080671

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SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Thermally insulated hollow metal doors with frames.

2.02 RELATED REQUIREMENTS

A. Section 087100 - Door Hardware.
B. Section 099600 – High-performance Coatings.

2.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.
C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.
D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2025.
E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.
G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2023.
H. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
I. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
K. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
L. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.
O. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.
P. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.

2.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
D. Installer's Qualification Statement.

2.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
B. Maintain at project site copies of reference standards relating to installation of products specified.

2.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

3.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
    1. Ceco Door, an Assa Abloy Group company
    2. Curries, an Assa Abloy Group company
    3. Mesker, dormakaba Group
    4. Republic Doors, an Allegion brand

3.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
    1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM

A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.

2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
4. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
    a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

3.03 HOLLOW METAL DOORS

A. Exterior Doors: Thermally insulated.
    1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
        a. Level 3 - Extra Heavy-duty.
        b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
        c. Model 1 - Full Flush.
        d. Door Face Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
        e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
    2. Door Core Material: Polyurethane, 1.8 lbs/cu ft minimum density.
        a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.

3. Door Thermal Resistance: R-Value of 8.7, minimum, for installed thickness of polyurethane.
4. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
5. Top Closures for Outswinging Doors: Flush with top of faces and edges.
6. Door Face Sheets: Flush.
7. Weatherstripping: Refer to Section 087100.
8. Door Finish: Factory primed and field finished.

3.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
B. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
   2. Frame Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
   3. Frame Finish: Factory primed and field finished.
   4. Weatherstripping: Separate, see Section 087100.

3.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

3.06 ACCESSORIES

A. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches (102 mm) as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Verify that finished walls are in plane to ensure proper door alignment.

4.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

4.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
B. Coordinate frame anchor placement with wall construction.
C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
D. Install door hardware as specified in Section 087100.

4.04 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

4.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

END OF SECTION 081113

SECTION 08 44 13 – GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

2.01 Section Includes

A. Aluminum-framed curtain wall, with vision glazing and infill panels.

2.02 Related Requirements

A. Section 05 12 00 - Structural Steel Framing: Steel attachment members.
B. Section 05 50 00 - Metal Fabrications: Steel attachment devices.
C. Section 07 25 00 - Weather Barriers: Sealing framing to water-resistive barrier installed on adjacent construction.
D. Section 07 92 00 - Joint Sealants: Sealing joints between frames and adjacent construction.
E. Section 08 80 00 - Glazing.

2.03 Reference Standards

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2025.
C. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
E. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
F. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
G. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

2.04 Submittals

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
D. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
E. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.
F. Structural Sealant Glazing (SSG): Submit product data and calculations showing compliance with performance requirements.
G. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
I. Installer's Qualification Statement.
J. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

2.05 Quality Assurance

A. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience and approved by manufacturer.

2.06 Delivery, Storage, and Handling

A. Handle products of this section in accordance with AAMA CW-10.
B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

2.07 Field Conditions

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

2.08 Warranty

A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Manufacturer Warranty: Provide 5-year manufacturer warranty against failure of glass seal on insulating glass units, including inter-pane dusting or misting. Include provision for replacement of failed units. Complete forms in Owner's name and register with installer.

C. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

3.01 Basis of Design - Curtain Wall Systems

A. Curtain Wall Assembly; Unitized and Thermally Enhanced:
   1. Basis of Design: Kawneer Company Inc.; 1600 Wall System 4 Curtain Wall.

B. Other Manufacturers: Provide either product identified as "Basis of Design" or an equivalent product of one of the manufacturers listed below.
   1. Arcadia, Inc
   2. Boyd Aluminum
   3. Coral Architectural Products, a division of Coral Industries, Inc
   4. DeSCo Archi., Inc.

C. Substitutions: See Section 016000 - Product Requirements.
   1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

3.02 Curtain Wall

A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Outside glazed, with pressure plate and mullion cover, where indicated on drawings.
   2. Vertical Mullion Face Width: 2-1/2 inches (63.5 mm).
   3. Vertical Mullion Depth From Face of Glazing to Back of Frame: 6 inches (159 mm).
   4. Finish: Class I color anodized.
      a. Factory finish surfaces that will be exposed in completed assemblies.
      b. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
   5. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.

6. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
   1. Design Wind Loads: Comply with the requirements of ASCE 7
      a. Member Deflection: For spans less than 13 feet 6 inches (4115 mm), limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch (19 mm), whichever is less and with full recovery of glazing materials.
   2. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with requirements of ASCE 7.
   3. Movement: Accommodate the following movement without damage to components or deterioration of seals:
      a. Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.
      b. Expansion and contraction caused by cycling temperature range of 170 degrees F (77 degrees C) over a 12 hour period.
      c. Movement of curtain wall relative to perimeter framing.
      d. Deflection of structural support framing, under permanent and dynamic loads.

C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
   1. Test Pressure Differential: 10 psf (480 Pa).

D. Air Leakage: 0.06 cfm/sq ft (0.3 L/sec sq m) maximum leakage of wall area when tested in accordance with ASTM E283/E283M at 6.24 psf (300 Pa) pressure difference across assembly.

E. Thermal Performance Requirements:
   1. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
   2. Overall U-value Including Glazing: 0.60 Btu/(hr sq ft deg F)

3.03 Components

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
B. Glazing: See Section 088000.

3.04 Materials

A. Extruded Aluminum: ASTM B221 (ASTM B221M).
B. Sheet Aluminum: ASTM B209/B209M.
C. Exposed Flashings: Aluminum sheet, 20-gauge, 0.032-inch (0.81 mm) minimum thickness; finish to match framing members.
D. Concealed Flashings: Sheet aluminum, 26-gauge, 0.017-inch (0.43 mm) minimum thickness.
E. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.
F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
G. Glazing Accessories: See Section 088000.

3.05 Finishes

A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils (0.018 mm) thick.
B. Color: To be selected by Architect from manufacturer's standard range.
C. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

4.01 Examination

A. Verify dimensions, tolerances, and method of attachment with other related work.
B. Verify that curtain wall openings and adjoining water-resistive and air barrier seal materials are ready to receive work of this section.
C. Verify that anchorage devices have been properly installed and located.

4.02 Installation

A. Install curtain wall system in accordance with manufacturer's instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
H. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

4.03 Tolerances

A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm/m) noncumulative or 0.5 inches per 100 feet (12 mm/30 m), whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).
C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch (19 mm) and minimum of 1/4 inch (6 mm).

4.04 Field Quality Control

A. See Section 014000 - Quality Requirements for general testing and inspection requirements.
B. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
    1. Perform a minimum of two tests in each designated area as indicated on drawings.
    2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
C. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

4.05 Cleaning

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
B. Remove protective material from pre-finished aluminum surfaces.
C. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, take care to remove dirt from corners, and wipe surfaces clean.

END OF SECTION 08 44 13

SECTION 09 21 16 0 GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.
B. Metal channel ceiling framing.
C. Gypsum sheathing.
D. Gypsum wallboard.
E. Joint treatment and accessories.
F. Textured finish system.

1.02 RELATED REQUIREMENTS

A. Section 054000 - Cold-Formed Metal Framing: Structural steel stud framing.
B. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.
C. Section 072100 - Thermal Insulation: Acoustic insulation.
D. Section 072500 - Weather Barriers: Water-resistive barrier over sheathing.
E. Section 072600 - Vapor Retarders: Vapor-impermeable membranes.
F. Section 072700 - Air Barriers: Air- and water-resistive barrier over sheathing.
G. Section 078400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
H. Section 079200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
I. Section 092216 - Non-Structural Metal Framing.

1.03 REFERENCE STANDARDS

A. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).
B. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2024.
E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.
F. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
G. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.

H. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2019 (Reapproved 2024).

I. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.

K. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.

L. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data:

1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.

C. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

D. Samples: Submit two samples of gypsum board finished with proposed texture application, 12 by 12 inches (300 by 300 mm) in size, indicating finish color and texture.

E. Test Reports: For stud framing products that do not comply with AISI S220 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

F. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

B. Documents at Project Site: Maintain at the project site a copy of manufacturer's instructions, erection drawings, and shop drawings.

1.07 Delivery, Storage, and Handling

A. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

B. Store metal products to prevent corrosion.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Grid Suspension Systems: Provide grid suspension systems in accordance with ASTM C840 and GA-216.

2.02 METAL FRAMING MATERIALS

A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.

B. Nonstructural Steel Framing for Application of Gypsum Board: See Section 092216.

C. Structural Steel Framing for Application of Gypsum Board: See Section 054000.

D. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).

1. Studs: C-shaped with knurled or embossed faces.
2. Runners: U shaped, sized to match studs.

E. Grid Suspension Systems: Steel grid system of main tees and support bars connected to structure using hanging wire.

1. Products:
   a. CertainTeed Corporation.
   b. USG Corporation; Drywall Suspension System.
   c. Substitutions: See Section 016000 - Product Requirements.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:

1. American Gypsum Company.
2. CertainTeed Corporation.
3. Georgia-Pacific Gypsum.
4. Gold Bond Building Products, LLC provided by National Gypsum Company.
5. PABCO Gypsum.
6. Substitutions: See Section 016000 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. Glass mat faced gypsum panels, as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   a. Mold resistant board is required at all wet locations.
4. Thickness:
   a. Vertical Surfaces: 5/8 inch (16 mm).
   b. Ceilings: 5/8 inch (16 mm).
5. Paper-Faced Products:
   a. American Gypsum Company; FireBloc Type X Gypsum Wallboard.

b. CertainTeed Corporation; Type X Drywall.
c. Georgia-Pacific Gypsum; ToughRock Fireguard X.
d. USG Corporation; Sheetrock Brand Firecode X Panels 5/8 in. (15.9 mm).
e. Substitutions: See Section 016000 - Product Requirements.

6. Mold-Resistant, Paper-Faced Products:
   a. American Gypsum Company; M-Bloc Type X.
   b. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.
   c. USG Corporation; Sheetrock Brand Mold Tough Firecode SCX Panels 5/8 in. .
   d. Substitutions: See Section 016000 - Product Requirements.
7. Glass Mat Faced Products:
   a. CertainTeed Corporation; 5/8" GlasRoc Interior Type X.
   b. Georgia-Pacific Gypsum; DensArmor Plus.
   c. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond eXP Interior Extreme Fire-Shield Gypsum Panel.
   d. USG Corporation; Sheetrock Brand Glass-Mat Panels Mold Tough Regular 5/8 in. .
   e. Substitutions: See Section 016000 - Product Requirements.

C. Exterior Sheathing Board: See Section 061000.

2.04 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: See Section 072100.

B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

1. Products:
   a. Franklin International, Inc; Titebond Acoustical Smoke & Sound Sealant.
   b. Liquid Nails, a brand of PPG Architectural Coatings.
   c. Specified Technologies Inc; Smoke N Sound Acoustical Sealant.
   d. Substitutions: See Section 016000 - Product Requirements.

C. Water-Resistive Barrier: See Section 072500.

D. Vapor Retarder: See Section 072600.

E. Air Barrier: See Section 072700.

F. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.

1. Types: As detailed or required for finished appearance.
2. Products:
   a. Phillips Manufacturing Co.
   b. Stockton Products; Extruded Aluminum.
   c. Trim-tex, Inc..
   d. Substitutions: See Section 016000 - Product Requirements.

G. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

1. Fiberglass Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners, except as otherwise indicated.

2. Paper Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
3. Joint Compound: Setting type, field-mixed.

H. Textured Finish Materials: Latex-based compound; plain.

1. Products:
   a. CertainTeed Corporation; Extreme Texture Coat/Acrylic Texture with M2Tech.
   b. Sherwin-Williams; Tuff Surface Premium Texture Finish.
   c. Substitutions: See Section 016000 - Product Requirements.

I. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C1007AISI S220 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

1. Level ceiling system to a tolerance of 1/1200.
2. Laterally brace entire suspension system.
3. Install bracing as required at exterior locations to resist wind uplift.

C. Studs: Space studs at 16 inches on center (at 406 mm on center).

1. Extend partition framing to structure where indicated and to ceiling in other locations.
2. Partitions Terminating at Ceiling: Attach ceiling runner securely to to ceiling framing in accordance with details.
3. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.

D. Blocking: Install mechanically fastened steel sheet blocking for support of:

1. Wall-mounted cabinets.
2. Plumbing fixtures.
3. Toilet partitions.
4. Toilet accessories.
5. Wall-mounted door hardware.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.04 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
2. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

3.07 TEXTURE FINISH

A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

3.09 Cleaning

A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

B. Clean.

3.10 Protection

A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION 092116

SECTION 07 22 16 – NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

2.01 SECTION INCLUDES

A. Metal partition, ceiling, and soffit framing.
B. Framing accessories.

2.02 RELATED REQUIREMENTS

A. Section 054000 - Cold-Formed Metal Framing: Requirements for structural, load-bearing, metal stud framing and exterior wall stud framing.
B. Section 072100 - Thermal Insulation: Acoustic insulation.
C. Section 072500 - Weather Barriers.
D. Section 076200 - Sheet Metal Flashing and Trim: Head and sill flashings.
E. Section 079200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
F. Section 085113 - Aluminum Windows: Product requirements for window anchors.
G. Section 092116 - Gypsum Board Assemblies: Metal studs for gypsum board partition framing.

2.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
F. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
G. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
H. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

2.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Shop Drawings:

1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

2.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

PART 2 PRODUCTS

3.01 FRAMING MATERIALS

A. Loadbearing Studs: As specified in Section 054000.

B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220.
1. Structural Grade: As required to meet design criteria.
2. Corrosion Protection Coating Designation: G40, or equivalent in accordance with AISI S220.

C. Non-Loadbearing Framing System Components: AISI S220; sheet steel, of size and properties necessary for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (L/240 at 240 Pa).
1. Studs: C-shaped with flat faces.
   a. Products:
      1) CEMCO; CT Studs
      2) ClarkDietrich; ProSTUD
      3) MarinoWARE; ViperStud Drywall Framing
2. Runners: U-shaped, sized to match studs.
3. Ceiling Channels: C-shaped.
4. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).

5. Resilient Furring Channels: Single or double leg configuration; 1/2 inch (12 mm) channel depth.
    a. Products:
        1) ClarkDietrich; RC Deluxe Resilient Channel
        2) Substitutions: See Section 016000 - Product Requirements.

D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws, and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code when evaluated in accordance with AISI S100.
2. Material: ASTM A653/A653M steel sheet, SS Grade 50.

E. Non-Loadbearing Framing Accessories:
1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
2. Bracing and Bridging: ASTM A653/A653M G90 galvanized steel; for lateral bracing of wall studs with slots for engaging on-module studs.
3. Framing Connectors: ASTM A653/A653M steel clips; secures cold rolled channel to wall studs for lateral bracing.
4. Sheet Metal Backing: 0.0395 inch (1.01 mm) thick.
5. Fasteners: ASTM C1002 self-piercing self-tapping screws.
6. Anchorage Devices: Powder actuated.
7. Acoustic Insulation: See Section 072100.
8. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
9. Touch-Up Primer for Corrosion Protected Surfaces: SSPC-Paint 20 Type I - Inorganic.

3.02 FABRICATION

A. Fabricate assemblies of framed sections to sizes and profiles required.
B. Fit, reinforce, and brace framing members to suit design requirements.

PART 3 EXECUTION

4.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify that rough-in utilities are in proper location.

4.02 INSTALLATION OF STUD FRAMING

A. Comply with requirements of ASTM C1007.
B. Install structural members and connections complying with ASTM C1007.
C. Extend partition framing to structure in all locations.
D. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
E. Align and secure top and bottom runners at 24 inches (600 mm) on center.
F. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
G. Install studs vertically at spacing indicated on drawings.
H. Align stud web openings horizontally.
I. Secure studs to tracks using crimping method. Do not weld.
J. Stud splicing is not permissible.
K. Fabricate corners using a minimum of three studs.
L. Install double studs at wall openings, door and window jambs, not more than 2 inches (50 mm) from each side of openings.
M. Coordinate erection of studs with requirements of door frames; install supports and attachments.
N. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
O. Blocking: Use steel channels secured to studs. Provide blocking for support of hardware and opening frames.
P. Furring: Install at spacing and locations shown on drawings. Lap splices a minimum of 6 inches (150 mm).

4.03 CEILING AND SOFFIT FRAMING

A. Comply with requirements of ASTM C754.

B. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
C. Install furring independent of walls, columns, and above-ceiling work.
D. Securely anchor hangers to structural members or embed them in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
E. Space main carrying channels at maximum 72 inches (1 800 mm) on center, and not more than 6 inches (150 mm) from wall surfaces. Lap splice securely.
F. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
G. Place furring channels perpendicular to carrying channels, not more than 2 inches (50 mm) from perimeter walls, and rigidly secure. Lap splices securely.
H. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches (600 mm) past each opening.
I. Laterally brace suspension system.

4.04 TOLERANCES

A. Maximum Variation from True Position: 1/8 inch in 10 feet (3 mm in 3 m).
B. Maximum Variation from Plumb: 1/8 inch in 10 feet (3 mm in 3 m).

END OF SECTION 092216

PART 1 GENERAL

1.01 Section Includes

A. Sound-absorbing panels.
B. Mounting accessories.

1.02 Related Requirements

A. Section 099123 - Interior Painting.

1.03 Reference Standards

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023, with Editorial Revision (2024).
B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
C. ASTM E795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests; 2023.

1.04 Submittals

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Manufacturer's printed data sheets for products specified.
C. Shop Drawings: Fabrication and installation details, panel layout.
D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 016000 - Product Requirements, for additional provisions.
    2. Extra Panels: Quantity equal to 5 percent of total installed, but not less than one of each type.

1.05 Quality Assurance

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with at least three years of documented experience.

1.06 Delivery, Storage, and Handling

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.
B. Store units flat, in dry, well-ventilated space; do not stand on end.

C. Protect edges from damage.

1.07 Mock-Ups

A. See Section 014000 - Quality Requirements for additional mock-up requirements.
B. Construct mock-up of acoustical units at location as indicated by Architect.
   1. Minimum mock-up dimensions; 96 by 96 inches (2440 by 2440 mm).
   2. Mock-up may remain as part of work.

PART 2 PRODUCTS

2.01 Wood Fiber Sound-Absorbing Units

A. Manufacturers:
   1. Armstrong World Industries, Inc; Tectum Direct Attach
   2. Troy Acoustics Corporation;
   3. Substitutions: See Section 016000 - Product Requirements.
B. Wood Fiber Acoustical Panels for Walls: Cementitious wood fiber.
   1. Thickness: 1 inch (25 mm).
   2. Composition: Aspen wood fibers bonded with inorganic hydraulic cement
   3. UL Classified Noise Reduction Coefficient (NRC): ASTM C 423 ; Mounting; D-20(0.45)
   4. UL Classified Flame Spread: ASTM E 1264; Class A. Product must be able to meet this criteria after being painted six times.
   5. Light Reflectance (LR) White Panel: ASTM E 1477; (Light Reflectance)
   6. Dimensional Stability/Mold Resistance: HumiGuard Plus and no significant mold growth when tested by ASTM D3273.
   7. USDA Certified Biobased Product, 98%
   8. Panel Edge: Square.
   9. Surface Pattern: Coarse.
   10. Surface Color: White or Natural.
   11. Mounting: Use fixing clips to attach to metal hat channels anchored to wall substrate.

2.02 Fabrication

A. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch (1.6 mm) for thickness, overall length and width, and squareness from corner to corner.
B. Factory-applied finishes on wood veneer panels to be uniform, smooth, and without blemishes.

2.03 Accessories

A. Spline-Mounting Accessories: Manufacturer's standard concealed connecting splines of extruded aluminum designed for screw attachment to walls, with coordinating moldings and trim for interior and exterior corners and miscellaneous conditions.
   1. Color of Exposed Trim: As selected from manufacturer's standards.
B. Back-Mounting Accessories: Manufacturer's standard accessories for concealed support, designed to allow panel removal, and as follows:
   1. Two-part clip and base-support bracket system; brackets designed to support full weight of panels and clips designed for lateral support, with one part mechanically attached to back of panel and the other attached to substrate.
C. Fixing Clips: Manufacturers standard for application as indicated.
D. Furring Strips: As indicated on drawings.

PART 3 EXECUTION

3.01 Examination

A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 Installation

A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.
B. Install mounting accessories and supports in accordance with shop drawings.
C. Furring Mounted Wood Veneer Panels:
   1. Install furring strip along meeting edges of adjacent panels to ensure they are attached to same furring strip along abutted edge; 24 inch (610 mm) on center, maximum.
   2. Install acoustic back-up material between furring as required for application.

3. Adhere first panel from edge to furring strip, and attach subsequent panels using fixing clips.

D. Furring-Mounted Cementitious Wood Fiber Panels:
   1. Install furring strip along meeting edges of adjacent panels to ensure they are attached to same furring strip along abutted edge; 24 inches (610 mm) on center, maximum.
   2. Install acoustic insulation between furring as indicated on drawings.
   3. Adhere first panel from edge to furring strip; attach subsequent panels using fasteners.

E. Install acoustical units to construction tolerances of plus or minus 1/16 inch (1.6 mm) for the following:
   1. Plumb and level.
   2. Flatness.

3.03 Cleaning

A. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 Protection

A. Provide protection of installed acoustical panels until Date of Substantial Completion.
B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION 098430

PART 1 GENERAL

1.01 SECTION INCLUDES

A. High performance coatings.
B. Surface preparation.

1.02 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
B. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2023.
C. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.
D. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
E. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
F. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
G. SSPC-SP 2 - Hand Tool Cleaning; 2024.
H. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.
I. ASTM D4414-95 – Standard Practice for Measurement of Wet Film

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide 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 (e.g. "alkyd enamel").
    2. MPI product number (e.g. MPI #47).
    3. Cross-reference to specified coating system(s) product is to be used in; include description of each system.
    4. Manufacturer's installation instructions.
    5. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.

C. Samples: Submit two samples 8 by 8 inch (203 by 203 mm) in size illustrating colors available for selection.
D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
E. Maintenance Data: Include cleaning procedures and repair and patching techniques.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 016000 - Product Requirements, for additional provisions.
    2. Extra Coating Materials: 1 gallon (4 liters) of each type and color.
    3. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

1.04 QUALITY ASSURANCE

A. Maintain one copy of each referenced document that applies to application on site.
B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
C. Applicator Qualifications: Company specializing in performing the work of this section with minimum 10 years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
C. Coating Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the coating product manufacturer.
C. Do not install materials when temperature is below 55 degrees F (13 degrees C) or above 90 degrees F (32 degrees C).
D. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.
F. Restrict traffic from area where coating is being applied or is curing.
G. The following information is for reference only. The existing paint and coatings by Sherwin Williams that were previously installed, based upon Owner's Maintenance Manuals, dated March 22, 2022.
    1. Drywall:
        a. Pva Drywall Primer And Sealer
        b. Promar 200 Zero Voc Interior Latex Eg-Shel
    2. Hollow Metal Frames
        a. P1 Procryl Pr Of W
        b. Pro Industrial Dtm Acrylic Semi-Gloss
    3. Steel (Except Doors)
        a. P1 Procryl Pr Of W
        b. Proindustrial Precatalyzed Waterbased Epoxy Eg-Shel
    4. Exterior Steel (Except Doors)
        a. Pro Industrial Dtm Acrylic Semi-Gloss
    5. Concrete Floor Sealer
        a. Endurpol Clr Hardner

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.
C. Warranty: Include coverage for bond to substrate.

PART 2 PRODUCTS

2.01 Manufacturers

A. Only materials (primers, coatings, etc.) listed in the latest edition of the MPI (APL) are acceptable for use on this project.
B. Provide high performance coating products from the same manufacturer to the greatest extent possible.
    1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.

C. High-Performance Coatings:
   1. APV Engineered Coatings:
   2. Dow
   3. Pittsburgh Paints
   4. Precision Coatings
   5. Sika Corporation
   6. Sherwin-Williams Company
   7. Tnemec Company, Inc
   8. Wolf-Gordon
   9. Substitutions: Section 016000 - Product Requirements.

2.02 HIGH-PERFORMANCE COATINGS

A. Material Compatibility:
   1. Materials for use within each paint system shall be 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 paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
   3. Products shall be of same manufacturer for each coat in a coating system.

B. MPI Standards: Provide products that comply with MPI standards indicated and are listed in MPI Approved Products List.

C. Provide coating systems that meet the following minimum performance criteria, unless more stringent criteria are specified:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0, maximum, when tested in accordance with ASTM E84.
   2. NFPA 101, Class A rated.
   3. Water Vapor Transmission: 0.1 Perms (max.)
   4. Scrubbability: Excellent.
   5. Acid Resistance: Able to withstand chemicals used in facility.
   6. Alkali Resistance: Able to withstand chemicals used in facility.

2.03 TOP COAT MATERIALS

A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.
   1. Volatile Organic Compound (VOC) Content:
      a. Provide coatings that comply with the most stringent requirements specified in the following:
         1) 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

B. Epoxy Coating :
   1. Number of coats: Two.
   2. Product Characteristics:
      a. Dry film thickness, as recommended per manufacturer.
      b. Comply with the performance requirements as recommended per manufacturer.
   3. Top Coat(s): High Performance Institutional, Two-Component, Water Based Epoxy Coating; MPI #252, #254, #255, #256.
      a. Sheen: Satin.
      b. Products:
         1) PPG Protective and Marine Coatings; Aquapon WB EP Two-Component Waterborne Epoxy, 98E-1/98E-100 Series, Semi-Gloss
         2) Rust-Oleum Corporation; Water-Based Epoxy Maintenance Coating - S60
         3) Sherwin-Williams; Pro Industrial Water Based Catalyzed Epoxy (MPI #254)
         4) Substitutions: Section 016000 - Product Requirements.
   4. Primer: As recommended by coating manufacturer for specific substrate.

C. High-Build Epoxy Coating :
   1. Number of Coats: Two.
   2. Product Characteristics:
      a. Dry film thickness, as recommended per manufacturer.
      b. Comply with the performance requirements specified above for severe exposure.
   3. Top Coat(s): Epoxy, High-Build; MPI #98, #108, #120.
      a. Sheen: Low gloss.

b. Products:
    1) PPG Protective and Marine Coatings; Amerlock 400 Epoxy, AK-400 Series, Semi-Gloss
    2) Rust-Oleum Corporation; ROCEpoxy Direct-to-Metal Mastic 9100
    3) Sherwin-Williams; Macropoxy 646 Fast Cure Epoxy. (MPI #108, #120)
    4) Sherwin-Williams; Pro Industrial High Performance Epoxy (MPI #98)
    5) Sumter Coatings, Inc. Enviro-Pox 949 High Build Epoxy Mastic
    6) Substitutions: Section 016000 - Product Requirements.

4. Primer: As recommended by coating manufacturer for specific substrate.

D. Shellac: Pure, white type.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by coating manufacturer.
1. Primer Sealer, Interior, Institutional Low Odor; MPI #149.
    a. Products:
        1) Pittsburgh Paints; Pure Performance Interior Latex Primer, 9-900 (MPI #149)
        2) Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Primer (MPI #149)
        3) Substitutions: Section 016000 - Product Requirements.
2. Block Filler, Epoxy; MPI #116.
    a. Products:
        1) PPG Protective and Marine Coatings; Amerlock 400 Epoxy Block Filler, 400BF.
        2) Substitutions: Section 016000 - Product Requirements.
3. Block Filler, Latex; MPI #4.
    a. Products:
        1) Pittsburgh Paints; Perma-Crete Concrete Block & Masonry Surfacer/Filler, 4-100XI. (MPI #4)
        2) Sherwin-Williams; Heavy Duty Block Filler (MPI #4)
        3) Substitutions: Section 016000 - Product Requirements.
4. Anti-Corrosive for Metal, Alkyd; MPI #79.
    a. Products:
        1) Pittsburgh Paints; Speedhide Interior/Exterior Rust Inhibitive Steel Primer, 6-212N Series (MPI #79)
        2) Sherwin-Williams; Kem Bond HS (MPI #79)

3) Sumter Coatings, Inc; Inhibitive Shopcoat Primer, 77 Series.

5. Anti-Corrosive for Metal, Epoxy; MPI #101.

a. Products:

1) PPG Protective and Marine Coatings; Amerlock 400 Epoxy, Semi-Gloss, AK-400 Series.

2) Precision Coatings, a RainguardPro Brand; DTM 1300 High Build Modified Epoxy Primer

3) Rust-Oleum Corporation; META Prime Epoxy Primer

4) Substitutions: Section 016000 - Product Requirements.

6. Alkali Resistant, Water Based; MPI #3.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of coated surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Do not begin application of coatings until substrates have been properly prepared.
C. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.
D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
F. Proceed with coating application only after unacceptable conditions have been corrected.
1. Commencing coating application constitutes Contractor's acceptance of substrates and conditions.

3.02 PREPARATION

A. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.
B. Clean surfaces of loose foreign matter.

C. Remove substances that would bleed through finished coatings. If unremovable, seal surface with shellac.

D. Remove finish hardware, fixture covers, and accessories and store.

E. Existing Painted and Sealed Surfaces:

1. Remove loose, flaking, and peeling paint. Feather edge and sand smooth edges of chipped paint.

2. Clean with mixture of trisodium phosphate and water to remove surface grease and foreign matter.

F. Masonry:

1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.

2. Prepare surface as recommended by coating manufacturer.

G. Galvanized Surfaces:

1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

2. Prepare surface according to SSPC-SP 2.

H. Ferrous Metal:

1. Solvent clean according to SSPC-SP 1.

2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3, and protect from corrosion until coated.

3.03 PRIMING

A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Concrete Masonry: Apply masonry filler to thickness required to fill holes and produce smooth surface; minimum thickness of 30 mils (0.8 mm).

3.04 COATING APPLICATION

A. Apply coatings in accordance with manufacturer's written instructions, to thicknesses specified and recommendations in MPI - Architectural Painting and Specification Manual.

B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.05 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements for general requirements for field inspection.

B. Wet Film Thickness Testing: Contractor shall observe and maintain record of Wet Film Testing for turnover to Owner and Architect upon completion.

1. Applicator shall perform Wet Film Thickness testing in accordance to ASTM D4414-95
    a. Testing shall be performed for each layer required for complete system performance.
2. Owner and Architect reserve the right to observe testing during application.
3. Tests shall be performed at the following rates:
    a. 1 test per 100 sf of vertical wall
    b. 1 test per 100 sf of horizontal surfaces or ceilings
    c. 4 tests per structural members, such as joists and beams, distributed on vertical and horizontal surfaces.
4. Tests shall be logged using physical identifiers, photo documentation as occurs, and charted accordingly.

C. Dry Film Thickness Testing: Owner will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.

1. Touch up and restore coated surfaces damaged by testing.
2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, and specified thickness, Contractor shall pay for retesting and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations, and specified thickness.

3.06 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.
D. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

3.07 PROTECTION

A. Protect finished work from damage.

3.08 SCHEDULE

A. Walls in Therapy Pool: Epoxy, gloss.
B. Walls in Equipment Rooms: High-build epoxy, gloss.
C. Exposed Hollow Metal, Steel Fabrications and Joists: Epoxy, gloss, shop applied to cleaned, bare metal; apply to exposed and concealed surfaces, and surfaces embedded in concrete as required to conform to performance requirements and resist corrosion.

END OF SECTION 09 96 00

SECTION 23 00 00 - MECHANICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 MECHANICAL REQUIREMENTS

A. The mechanical requirements are supplemental to the General Requirements of these Specifications. The Mechanical Sections shall apply to phases of the work specified, shown on the Drawings, or required to provide for the complete installation of Mechanical Systems for this project.

B. The work shall include all items, articles, materials, operations and methods listed, mentioned, or scheduled in these specifications and the accompanying drawings. All material, equipment, and labor shall be furnished together with all incidental items required by good practice to provide the complete systems described.

C. Examine and refer to all Architectural, Civil, Structural, Electrical, Utility, Landscape and Mechanical drawings and specifications for construction conditions which may affect the mechanical work. Inspect the building site and existing facilities for verification of present conditions. Make proper provisions for these conditions in performance of the work and cost thereof.

1.2 CODES AND STANDARDS

A. Work shall meet the requirements of the plans and specifications and shall not be less than the minimum requirements of applicable sections of the latest Codes and Standards of the following Organizations:

1. American Gas Association (AGA)
2. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
3. American Society of Mechanical Engineers (ASME)
4. American Water Works Association (AWWA)
5. National Electrical Code (NEC)
6. National Electrical Manufacturers Association (NEMA)
7. National Fire Protection Association (NFPA)
8. International Plumbing Code
9. Occupational Safety & Health Act (OSHA)
10. Plastic Pipe Institute (PPI)
11. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
12. International Mechanical Code (IMC)
13. International Building Code (IBC)
14. International Plumbing Code (IPC)
15. Requirements of the Serving Utility Company
16. Local and State Codes and Ordinances
17. SMACNA Seismic Manual

1.3 FEES AND PERMITS

A. The Mechanical Contractor shall pay all fees and arrange for all permits required for work done under his contract and under his supervision by subcontract.

B. All usage contracts between the Owner and the serving utilities company, such as membership and usage charges or fees, etc., for the purpose of obtaining the services for the utility company shall be applied for and paid for by the Owner.

C. All permits and fees for connection to the utility, including inspection and staking costs imposed by the utility company or required for proper installation, and all necessary manholes, encasements, valves, service boxes, meters, meter housings or vaults complete as required by the utility company of jurisdictional agency, shall be applied for and paid by the Mechanical Contractor.

D. Exception: The gas service from the main to and including the gas meter will be furnished and installed by the gas company and paid for by the Owner.

1.4 MATERIALS AND EQUIPMENT

A. Manufacturers trade names and catalog numbers listed are intended to indicate the quality of equipment or materials desired. Manufacturers not listed must have prior approval. Written prior approval must be obtained from the Architect/Engineer ten (10) days prior to bid opening. Requests are to be submitted sufficiently ahead of the deadline to give ample time for examination. The items approved will be listed in an addendum and only this list of equipment will be accepted in lieu of specified products. Submittals must indicate the specific item or items to be furnished in lieu of those specified, together with complete technical and comparative data on specified items and proposed items. See list of prior approved manufacturers at end of this section.

B. Mechanical equipment may be installed with manufacturer’s standard finish and color except where specific color, finish or choice is indicated. If the manufacturer has no standard finish, equipment shall have a prime coat and two finish coats of gray enamel.

C. This Contractor shall be responsible for materials and equipment installed under this contract. Contractor shall also be responsible for the protection of materials and equipment of others from damage as a result of his work.

D. Manufactured material and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed by manufacturer unless herein specified to the contrary.

E. This Contractor shall make the required arrangement with General Contractor for the introduction into the building of equipment too large to pass through finished openings.

F. Store materials and equipment indoors at the job site or, if this is not possible, store on raised platforms and protect from the weather by means of waterproof covers. Coverings shall permit circulation of air around the materials to prevent condensation of moisture. Screen or cap openings in equipment to prevent the entry of vermin.

1.5 INTENT OF DRAWINGS

A. The drawings are partly diagrammatic and do not necessarily show exact location of piping and ductwork unless specifically dimensioned. Riser and other diagrams are schematic and do not necessarily show the physical arrangement of the equipment. They shall not be used for obtaining lineal runs of piping or ductwork, nor shall they be used for shop drawings for piping and ductwork fabrication or ordering. Discrepancies shown on different plans, or between plans and actual field conditions shall be brought to the attention of the Architect/Engineer for resolution.

1.6 RESPONSIBILITY

A. The Mechanical Contractor shall be responsible for the installation of a satisfactory and complete system in accordance with the intent of the drawing and specifications. Provide, at no extra cost, all incidental items required for completion of the work even though they are not specifically mentioned or indicated on the drawings or in the specifications.

B. The drawings do not attempt to show complete details of the building construction which affect the mechanical installation; and reference is therefore required to the Architectural, Civil, Structural, Landscape and Electrical drawings and specifications and to shop drawings of all trades for additional details which affect the installation of the work covered under this Division of the Contract.

C. Location of mechanical system components shall be checked for conflicts with openings, structural members and components of other systems having fixed locations. In the event of any conflicts, the Architect/Engineer shall be consulted and his decision shall govern. Necessary changes shall be made at the Contractor’s expense.

D. Determine, and be responsible for, the proper location and character of inserts for hangers, chases, sleeves, and other openings in the construction required for the work, and obtain this information well in advance of the construction progress so work will not be delayed.

E. Final location of inserts, hangers, etc., required for each installation, must be coordinated with facilities required for other installations to prevent interference.

F. Take extreme caution not to install work that connects to equipment until such time as complete Shop Drawings of such equipment have been approved by the Architect/Engineer. Any work installed by the Contractor, prior to approval of Shop Drawings, will be at the Contractor's risk.

G. At all times during the performance of this Contract, properly protect work from damage and protect the Owner's property from injury of loss. Make good any damage, injury or loss, except such as may be directly due to errors in the Bidding Documents or caused by Agents or Employees of the Owner. Adequately protect adjacent property as provided by law and the Bidding Documents. Provide and maintain passageways, guard fences, lights and other facilities for protection required by Public Authority or Local conditions.

H. The Contractor shall be responsible for damages due to the work of their Contractors, to the building or its contents, people, etc.

1.7 REVIEW

A. All work and material is subject to review at any time by the Architect/Engineer or his representative. If the Architect/Engineer or his representative finds material that does not conform with these specifications or that is not properly installed or finished, correct the deficiencies in a manner satisfactory to the Architect/Engineer at the Contractor's expense.

1.8 WORKMANSHIP

A. GENERAL

1. Work under this contract shall be performed by workmen skilled in the particular trade, including work necessary to properly complete the installation in a workmanlike manner to present a neat and finished appearance.

B. EXCAVATION AND BACKFILL

1. Provide all excavating and backfilling as required, with backfilling only after approval of the Architect. Backfill to be free of all debris and decayable matter. See Excavation and Backfill requirements in DIVISION 31 – EARTH MOVING.

C. CUTTING, PATCHING, AND FRAMING

1. Obtain Architect's/Engineer's approval before performing any cutting on structural members or patching of building surfaces. Any damage to the building or equipment by this Contractor shall be the responsibility of this Contractor and shall be repaired by skilled craftsmen of the trades involved at the Contractor's expense.
2. Chases, openings, sleeves, hangers, anchors, recesses, equipment pads, framing for equipment, provided by others only if so noted on the drawings. Otherwise, they will be provided by this Contractor for his work. Whether chases, etc., are provided by this Contractor or others, this Contractor is responsible for correct size and locations.

1.9 COORDINATION

A. This Contractor shall plan his work to proceed with a minimum interference with other trades and it shall be his responsibility to inform the General Contractor of all openings required in the building structure for installation of work, and to provide sleeves as required. Dimensions of equipment installed and/or provided by others shall be checked in order that correct clearances and connections may be made.

1.10 CLEAN UP

A. Keep the premises free from accumulation of waste material or rubbish caused by his work or employees.

B. Upon completion of work, remove materials, scraps and debris relative to his work and leave the premises, including tunnels, crawl spaces, and pipe chases in clean and orderly condition. Remove all dirt and debris from the interior and exterior of all devices and equipment. After construction is completed, wash all mechanical equipment.

1.11 DUST PROTECTION

A. Contractor will provide suitable dust protection for all existing areas prior to beginning of cutting or demolition. Contractor will obtain approval of partition from Owner before proceeding with work involved in these rooms.

1.12 TEMPORARY FACILITIES

A. OFFICES

1. Contractor may provide a temporary office for himself and for the periodic use by the Architect\Engineer.

B. REMOVAL

1. Contractor shall completely remove his temporary installations when no longer needed and the premises shall be completely clean, disinfected, patched, and refinished to match adjacent areas.

C. LADDERS AND SCAFFOLDS

1. The Contractor shall provide their own ladders, scaffolds, etc. of substantial construction for access to their work in various portions of the building as may be required. When no longer needed, they shall be removed by the Contractor.

D. PROTECTION DEVICES

1. The Contractor shall provide and maintain his own necessary barricades, fences, signal lights, etc., required by all governing authorities or shown on the drawings. When no longer needed, they shall be removed by the Contractor. The Contractor shall assume all responsibility for which the Owner may be held responsible because of lack of above items.

E. TEMPORARY WATER

1. The Contractor shall provide all water required by his trade for construction. Temporary drinking water shall be provided by Contractor from a proven safe source dispensed by single service containers, until such time as the construction water outlet has been installed, disinfected, and approved for drinking purposes.

F. TEMPORARY FIRE PROTECTION

1. The Contractor shall provide all necessary first-aid hand fire extinguishers for Class A, B, C and special hazards as may exist in his own work area only in accordance with good and safe practice and as required by jurisdictional safety authority. The Contractor shall provide general area fire extinguishers only.

1.13 SHOP DRAWINGS

A. Provide electronic pdf files of manufacturer's literature and/or certified prints as soon as possible but within thirty (30) days after awarding of Contract, for items of materials, equipment, or systems where called for in specifications. Shop drawings and literature complete showing item used, size, dimensions, capacity, rough-in, etc., as required for complete check and installation. Manufacturers literature showing more than one item shall be clearly marked as to which item is being furnished or it will be rejected and returned without review.

B. Each copy of each item submitted must be clearly marked as follows for purposes of identification and record. Submittals not marked (typewritten only) as described below will be rejected and returned without review.

Date:
Name of Project:
Branch of Work:
Submitted by:
Specification or Plan Reference:

C. Prior to their submission, each submittal shall be thoroughly checked by the Contractor for compliance with the Contract Document requirements, accuracy of dimensions, relationship to the work of other trades, and conformance with sound, safe practices as to erection and installation. Each submittal shall then bear a stamp evidencing such checking and shall show corrections made, if any. Submittals requiring extensive corrections shall be revised before submission. Each submittal not stamped and signed by the Contractor evidencing such checking will be rejected and returned without review.

D. All submittals will be examined when submitted in proper form for compliance. Such review shall not relieve the Contractor of responsibility for errors, for deviation from the contract Documents, nor for violation of sound safety practices.

E. The Contractor shall keep in the field office one print of each submittal which has been reviewed and stamped by the Architect or Engineer.

F. Submittals will be required for each item of material and equipment furnished as noted in specifications.

G. Submittals which are incomplete relative to quality requirements, capacity, engineering data, dimensional data or detailed list of specialty or control equipment will be rejected. Lists shall include descriptive coding as specified or shown on drawings.

THE ENGINEER WILL PERFORM SHOP DRAWING REVIEW OF EACH ITEM; HOWEVER, SUBSEQUENT REVIEW OF ITEMS PREVIOUSLY REJECTED WILL BE BILLED TO THE CONTRACTOR AT A RATE OF $75 PER HOUR.

1.14 OPERATION AND MAINTENANCE MANUALS

A. At the time orders are placed for any item of equipment requiring service or operating maintenance, the Contractor shall request the manufacturer furnish three (3) copies and electronic pdf version of OPERATION AND MAINTENANCE INSTRUCTIONS for each piece of equipment. These shall be included in the brochure of equipment.

1.15 BROCHURE OF EQUIPMENT

A. Upon completion of work, prepare three copies of "Brochure of Equipment" containing data pertinent to equipment and systems on job. Binders containing materials shall be one or more three ring binders of sufficient number to hold all literature. Contained in binders shall be: Installation, maintenance, and operating instructions for each piece of equipment; parts lists; wiring diagrams; one copy of each shop drawing and literature submittal; record drawings, etc.

B. All literature shall be clean, unused and filed under divider headings corresponding to the specifications.

C. These brochures shall be submitted to the Architect/Engineer and approved by him before authorization of final payment.

1.16 AS-BUILT DRAWINGS

A. The Contractor shall furnish to the Owner and Architect/Engineer a marked print showing the location of all concealed or underground pipe or conduit runs and other equipment installed other than as shown on the drawings. Dimension underground lines from established building lines. Indicate all installed pull boxes in conduit runs.

B. The Contractor shall furnish to the Architect/Engineer a marked print showing the location of all mechanical equipment, plumbing fixtures, piping, ductwork, diffusers, grilles, etc. The location of any item which deviates from the bid documents shall be accurately drawn and dimensioned.

C. All underground piping and ductwork shall be dimensioned from nearest column and/or exterior walls. The location of all maintenance related items such as duct access doors, fire dampers, isolation valves, filters, etc., shall be highlighted on as built drawing.

1.17 PLACING SYSTEMS IN OPERATION

A. At the completion of the work and at such time as the Owner shall direct, prior to final acceptance, the Contractor performing this work shall put into satisfactory operation the various systems installed under the specifications. At no additional cost to the Owner, furnish the services of a person completely familiar with the installations performed under this specification, to instruct the Owner’s operating personnel in the proper operation and servicing of the equipment and systems. These services shall be available for a period of no less than one (1) day.

1.18 WARRANTY

A. The Contractor shall guarantee that all materials and labor installed are new and of first quality and that any material or labor found defective shall be replaced without cost to the Owner within one (1) year after substantial completion of the Contract or one (1) full season of heating and cooling operation, whichever is the greater. The guarantee shall list the date of the beginning of the one (1) year period, which shall be the date that the Substantial Completion Certificate is issued.

B. Any damage to the building, caused by defective work or material of the Contractor within the above-mentioned period, shall be satisfactorily repaired without cost to the Owner.

C. The guarantee does not include maintenance of equipment. The Owner shall accept full responsibility for proper operation and maintenance of equipment immediately upon substantial completion and occupancy of the building.

D. Final acceptance by the Owner will not occur until all operating instructions are mounted in Equipment Rooms and Operating Personnel thoroughly indoctrinated in the operation of all mechanical equipment by the Contractor.

E. Any equipment, including heat exchangers, boilers, pumps, air handlers, motors, etc., used for temporary heat, shall be brought up to a new condition before final acceptance by the Owner and shall be guaranteed by the Contractor as new equipment.

END OF SECTION 23 00 00

SECTION 31 10 00 – SITE CLEARING

PART 1 GENERAL

2.01 Section Includes

A. Clearing and grubbing.
B. Selective removal and trimming.
C. Repair and restoration.
D. Debris removal.
E. Disconnecting, capping or sealing, and removing site utilities.
F. Temporary erosion and sedimentation control.

2.02 Related Requirements

A. Section 02 41 00 – Selective Demolition: Removal of built elements and utilities.

2.03 Reference Standards

A. 29 CFR 1910.266 - Logging Operations; Current Edition.
B. ANSI A300 Part 1 - American National Standard for Tree Care Operations - Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning); 2017.
C. ANSI A300 Part 5 - American National Standard for Tree Care Operations – Tree, Shrub and Other Woody Plant Maintenance Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction); 2019.
D. ANSI Z133 - American National Standard for Arboricultural Operations - Safety Requirements; 2017.

2.04 DEFINITIONS

A. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
B. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "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; the zone where plant roots grow.
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 indicated on Drawings.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

2.05 MATERIAL OWNERSHIP

A. Except for 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.

2.06 Administrative Requirements

A. Preinstallation Meeting: Convene prework meeting one week prior to start of work of this section; require attendance by affected personnel.

2.07 Submittals

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
B. Site Plan:
   1. Indicate areas for temporary construction and field offices.
C. Clearing Firm Qualification Statement: Documentation of specialized experience.
D. Existing Conditions Report: Written documentation of vegetation to remain, see Section 01 30 00 - Administrative Requirements.
E. Photographs: Photographic documentation of existing vegetation.

2.08 Quality Assurance

A. Clearing Firm Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.

PART 2 PRODUCTS

3.01 Materials

A. Sedimentation Barrier: See Section 01 57 13 - Temporary Erosion and Sediment Control.
B. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 31 20 00 "Earth Moving."
C. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.
D. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #23 (surface-tolerant, anticorrosive metal primer).

PART 3 EXECUTION

4.01 Examination

A. Comply with additional requirements specified in Section 017000 - Execution and Closeout Requirements.
B. Construction Fencing: See Section 01 50 00 - Temporary Facilities and Controls.
C. Identify potential dust sources.

4.02 Preparation

A. Protect and maintain benchmarks and survey control points from disturbance during construction.
B. Protect existing site improvements to remain from damage during construction.
C. Restore damaged improvements to their original condition, as acceptable to Owner.
D. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
E. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
F. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.
G. Protect existing structures and other elements that are to remain.
H. Protect existing vegetation to remain from damage and monitor according to ANSI A300 Part 5.
    1. Photograph vegetation with documentation indicating data, time, weather, and brief description of health condition.
I. Do not commence site clearing operations until temporary erosion- and sedimentation-control measures are in place. Install sedimentation barrier according to Section 01 57 13 - Temporary Erosion and Sediment Control.
J. Develop dust remediation controls and methods. Do not use water if that results in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
K. Remove preexisting debris, junk, and trash on-site.

4.03 Existing Utilities

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed.
B. Arrange with utility companies and/or owner to shut off indicated utilities.
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:

D. Notify Owner not less than two days in advance of proposed utility interruptions.
E. Do not proceed with utility interruptions without Engineer's written permission.
F. Removal of underground utilities is included in earthwork sections; in applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security, and utilities sections; and in Section 02 41 19 "Selective Demolition."

4.04 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.

4.05 Clearing and Grubbing

A. Clearing: Cut trees, stumps, shrubs, downed timber, and other vegetation for removal within identified area as indicated on drawings according to 29 CFR 1910.266. Follow recommendations of ANSI Z133 and best local practices for species involved.
B. Do not remove or damage vegetation beyond limits indicated on drawings.
C. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum subsoil disturbance.
D. Soil Stripping, Handling, and Stockpiling: Perform only when the soil is dry or slightly moist.

4.06 Selective Removal and Trimming

A. Selective Removal: Individual tree and shrub identified for removal as indicated on drawings according to 29 CFR 1910.266.

4.07 Removed Vegetation Processing

A. Do not burn, bury, landfill, or leave on-site, except as indicated on drawings.

4.08 Site Improvements

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
C. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
D. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

4.09 Repair and Restoration

A. Remaining Existing Facilities, Utilities, and Site Features: If damaged due to this work, repair or replace to original condition.
B. Vegetation: Replace damaged or destroyed vegetation identified to remain as indicated on drawings at no cost to Owner:
    1. Outside removal limits.

4.10 Debris Removal

A. Remove debris, junk, and trash from site.
B. Leave site in clean condition, ready for subsequent work.
C. Clean up spillage and windblown debris from public and private lands.

4.11 Cleaning

A. See Section 01 70 00 - Execution and Closeout Requirements for additional requirements.
B. 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 unless indicated on drawings
C. Leave site clean and ready to receive work.

END OF SECTION 31 10 00

SECTION 31 20 00 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing and installing Subbase course for concrete walks and pavement.
3. Utility Trench excavation and filling.

B. Related Requirements:

1. Section 01 32 00 "Construction Progress Documentation" for recording preexcavation and earth-moving progress.

1.3 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 the subbase course and 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 Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.

3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, 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 of rock material that exceed 1 cu. yd. for bulk excavation or 3/4 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. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- maximum-width, 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.
2. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket.

I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by a geotechnical testing agency, according to ASTM D1586.

J. 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.

K. Subbase Course: Aggregate layer placed between the subgrade and base course for pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete walk.

L. 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.

M. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.4 FIELD 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. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.

1. Do not proceed with work on adjoining property until directed by Engineer.

C. Utility Locator Service: Notify "One Call" for area where Project is located before beginning earth-moving operations.

D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures are complete

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

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

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.

1. Liquid Limit: 30.
2. Plasticity Index: 10.

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: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; 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 D2940/D2940M; 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 or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero 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 D448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and zero to 5 percent passing a No. 4 sieve.

J. Sand: ASTM C33/C33M; fine aggregate.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 CONTROLLED LOW-STRENGTH MATERIAL

A. Controlled Low-Strength Material: Self-compacting, flowable concrete material produced from the following:

1. Portland Cement: ASTM C150/C150M, Type II.
2. Fly Ash: ASTM C618, Class C or F.
3. Normal-Weight Aggregate: ASTM C33/C33M, 3/4-inch nominal maximum aggregate size.
4. Foaming Agent: ASTM C869/C869M.
5. Water: ASTM C94/C94M.
6. Air-Entraining Admixture: ASTM C260/C260M.

B. Produce low-density, controlled low-strength material with the following physical properties:

1. As-Cast Unit Weight: 30 to 36 lb/cu. ft. at point of placement, when tested according to ASTM C138/C138M.
2. Compressive Strength: 80 psi, when tested according to ASTM C495/C495M.

C. Produce conventional-weight, controlled low-strength material with **140-psi** compressive strength when tested according to ASTM C495/C495M.

PART 3 - EXECUTION

3.1 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.

3.2 DEWATERING

A. Provide dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

B. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

C. 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.

D. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Unclassified Excavation: 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. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches beneath bottom of concrete slabs-on-grade.
f. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

B. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Engineer. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations 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. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
e. 6 inches beneath bottom of concrete slabs-on-grade.
f. 6 inches beneath pipe in trenches and the greater of 24 inches wider than pipe or 42 inches wide.

3.5 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.6 SUBGRADE INSPECTION

A. Notify Engineer when excavations have reached required subgrade.

B. If Engineer 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 3 mph.
2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material 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 Engineer, without additional compensation.

3.7 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 Engineer.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Engineer.

3.8 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.

3.9 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, damp proofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, 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.

3.10 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. 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.

C. Backfill voids with satisfactory soil while removing shoring and bracing.

D. Initial Backfill:

1. Soil Backfill: Place and compact initial backfill of, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

a. Carefully compact initial backfills 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. Final Backfill:

1. Soil Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

3.11 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.

3.12 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.

3.13 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 ASTM D1557:

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 92 percent.

3.14 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 elevations required to achieve indicated finish elevations, within the following subgrade 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.

3.15 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 of 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 ASTM D1557.

B. Drainage Backfill: Place and compact filter 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 D1557.
2. Place and compact impervious fill over drainage backfill in 6-inch- thick compacted layers to final subgrade.

3.16 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 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 course 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 ASTM D1557.

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 ASTM D1557.

3.17 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Install subdrainage geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
2. Place drainage course 6 inches or less in compacted thickness in a single layer.
3. Place drainage 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.
4. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D1557.

3.18 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 Engineer; 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.

END OF SECTION 31 20 00

SECTION 32 13 13 - CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes Concrete Paving Including the Following:

1. Parking lots.
2. Curbs and gutters.
3. Walks.
4. Joint Sealants.

B. Related Requirements:

1. Section 03 30 00 " Cast-in-Place Concrete" for general building applications of concrete.
2. Section 32 13 73 "Concrete Paving Joint Sealants" for joint sealants in expansion and contraction joints within concrete paving and in joints between concrete paving and asphalt paving or adjacent construction.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash, slag cement, and other pozzolans.

B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 FIELD CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Cold-Weather Concrete Placement: Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing, or low temperatures. Comply with ACI 306.1 and the following:

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in design mixtures.

C. Hot-Weather Concrete Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to 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 in total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap, so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

2.2 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

1. Use flexible or uniformly curved forms for curves with a radius of 100 feet or less. Do not use notched and bent forms.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and that will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

B. Epoxy-Coated Reinforcing Bars: ASTM A 775/A 775M or ASTM A 934/A 934M; with ASTM A 615/A 615M, Grade 60 deformed bars.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

D. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating, compatible with epoxy coating on reinforcement.

E. Zinc Repair Material: ASTM A 780/A 780M.

2.4 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C 150/C 150M, portland cement Type I/II.
2. Fly Ash: ASTM C 618, Class C or Class F.

B. Normal-Weight Aggregates: ASTM C 33/C 33M, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1-1/2 inches nominal.

C. Air-Entraining Admixture: ASTM C 260/C 260M.

D. Water: Potable and complying with ASTM C 94/C 94M.

2.5 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Slag Cement: 50 percent.
3. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 5-1/2 percent plus or minus 1-1/2 percent for 1-1/2-inch nominal maximum aggregate size.

D. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.

E. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 4500 psi.
2. Maximum W/C Ratio at Point of Placement: 0.45.
3. Slump Limit: 4 inches, plus or minus 1 inch.

2.6 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M. Furnish batch certificates for each batch discharged and used in the Work.

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 - JOINT SEALANT

3.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

3.2 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Nonsag, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type NS.

B. Single-Component, Self-Leveling, Silicone Joint Sealant: ASTM D 5893/D 5893M, Type SL.

C. Multicomponent, Nonsag, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use T.

D. Single Component, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type S, Grade P, Class 25, for Use T.

E. Multicomponent, Pourable, Urethane, Elastomeric Joint Sealant: ASTM C 920, Type M, Grade P, Class 25, for Use T.

3.3 JOINT-SEALANT BACKER MATERIALS

A. Joint-Sealant Backer Materials: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint-sealant manufacturer, based on field experience and laboratory testing.

B. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

3.4 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.

PART 4 - EXECUTION

4.1 EXAMINATION

A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Examine joints to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

C. Proof-roll prepared subbase surface below concrete paving to identify soft pockets and areas of excess yielding.

1. Completely proof-roll subbase in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
2. Proof-roll with a pneumatic-tired and loaded, 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
3. Correct subbase with soft spots and areas of pumping or rutting exceeding depth of 1/2 inch according to requirements in Section 31 20 00 "Earth Moving."

D. Proceed with installation only after unsatisfactory conditions have been corrected.

4.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

B. Surface Cleaning of Joints: Before installing joint sealants, clean out joints immediately to comply with joint-sealant manufacturer's written instructions.

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

C. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

4.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

4.4 STEEL REINFORCEMENT INSTALLATION

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

D. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap of adjacent mats.

4.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

1. When joining existing paving, place transverse joints to align with previously placed joints unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

1. Continue steel reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of paving strips unless otherwise indicated.
2. Provide tie bars at sides of paving strips where indicated.
3. Butt Joints: Use epoxy-bonding adhesive at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 50 feet unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler not less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Place top of joint filler flush with finished concrete surface if joint sealant is not indicated.
5. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
6. During concrete placement, protect top edge of joint filler with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows, to match jointing of existing adjacent concrete paving:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

a. Tolerance: Ensure that sawed joints are within 3 inches either way from centers of dowels.

2. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or coat with asphalt one-half of dowel length to prevent concrete bonding to one side of joint.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

4.6 CONCRETE PLACEMENT

A. Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast-in.

B. Remove snow, ice, or frost from subbase surface and steel reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement dowels and joint devices.

H. Screed paving surface with a straightedge and strike off.

I. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

J. Curbs and Gutters: Use design mixture for automatic machine placement. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing.

K. Slip-Form Paving: Use design mixture for automatic machine placement. Produce paving to required thickness, lines, grades, finish, and jointing.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of slip-form paving machine during operations.

4.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
2. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8-inch-deep with a stiff-bristled broom, perpendicular to line of traffic.

4.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing moisture-retaining-cover curing or a combination of these as follows:

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. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches, and

sealed by waterproof tape or adhesive. Immediately repair any holes or tears occurring during installation or curing period, using cover material and waterproof tape.

4.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-feet- long; unleveled straightedge not to exceed 1/2 inch.
4. Alignment of Tie-Bar End Relative to Line Perpendicular to Paving Edge: 1/2 inch per 12 inches of tie bar.
5. Lateral Alignment and Spacing of Dowels: 1 inch.
6. Vertical Alignment of Dowels: 1/4 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Paving Edge: 1/4 inch per 12 inches of dowel.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

4.10 INSTALLATION OF JOINT SEALANTS

A. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions.

C. Install joint-sealant backings to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of joint-sealant backings.
2. Do not stretch, twist, puncture, or tear joint-sealant backings.
3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install joint sealants immediately following backing installation, using proven techniques that comply with the following:

1. Place joint sealants so they fully contact joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

4.11 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Engineer.

B. Drill test cores, where directed by Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory paving areas with portland cement concrete bonded to paving with epoxy adhesive.

C. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

4.12 CLEANING AND PROTECTION

A. Clean off excess joint sealant as the Work progresses, by methods and with cleaning materials approved in writing by joint-sealant manufacturers.

END OF SECTION 32 13 13